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DATA ONLY REPORT OF LANDSAT USER SURVEY

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MITRETEK SYSTEMS

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Purpose

Stennis sponsored a survey of Landsat 7 users to help record:

- What types of organizations were buying data?
- What organizations were the end users?
- What the data were used for?
- The relative importance of the radiometric and system features for the user's applications.
- The relative importance of Landsat continuity.

Process

- Mitretek Systems developed a questionnaire with the help and final approval of the LDCM formulation team.
- An e-mail was sent to the purchasers of Landsat 7 data provided a link to the questionnaire at the Mitretek site.
- The responses were made on-line anonymously.
- Mitretek received 129 replies, about a 17% return from the 710 surveys sent from the FY00 list.
- The responses include both ranking numbers and comments.

Definitions

- Educational (EDU) are those respondents identified as College, University or Kindergarten through 12^{th} Grade programs.
- Commercial (COM) are those respondents identified as Data Distributors or Value Added enterprise.

- Government (GOV) are those respondents identified as Local, Regional, Federal “Civil or Defense”, Multi-National or Non- U.S. Government.

NOTE: The category Organization (ORG) was added to the Commercial (COM) for the future analysis due to the small sample size unless identified.

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Questionnaire Responses

Section 1: The data, who purchased it, who is the end user, what it is used for?

- A. Organization
  - "My" Organization
  - End User Organization
  - End User Number of Scenes
- B. General categories of ETM+ data use/application
- C. Number of scenes purchased from EDC since October 01, 1999
- D. Scenes purchased from foreign sources or elsewhere
- E. Anticipated number of ETM+ scenes to be purchased next year

Section 2: Sensor related questions

- ETM+ Evaluation
- Radiometric Calibration, Accuracy and Sensitivity

Section 3: System related issues

- Spatial Resolution
- Geodetic Accuracy
- Repetition Rates
- Data Collection Practices
- Other Satellite Data

Section 4: Policy

- Policy Comments
- Current Price
- Continued Operation of Landsat 5
- General Comments

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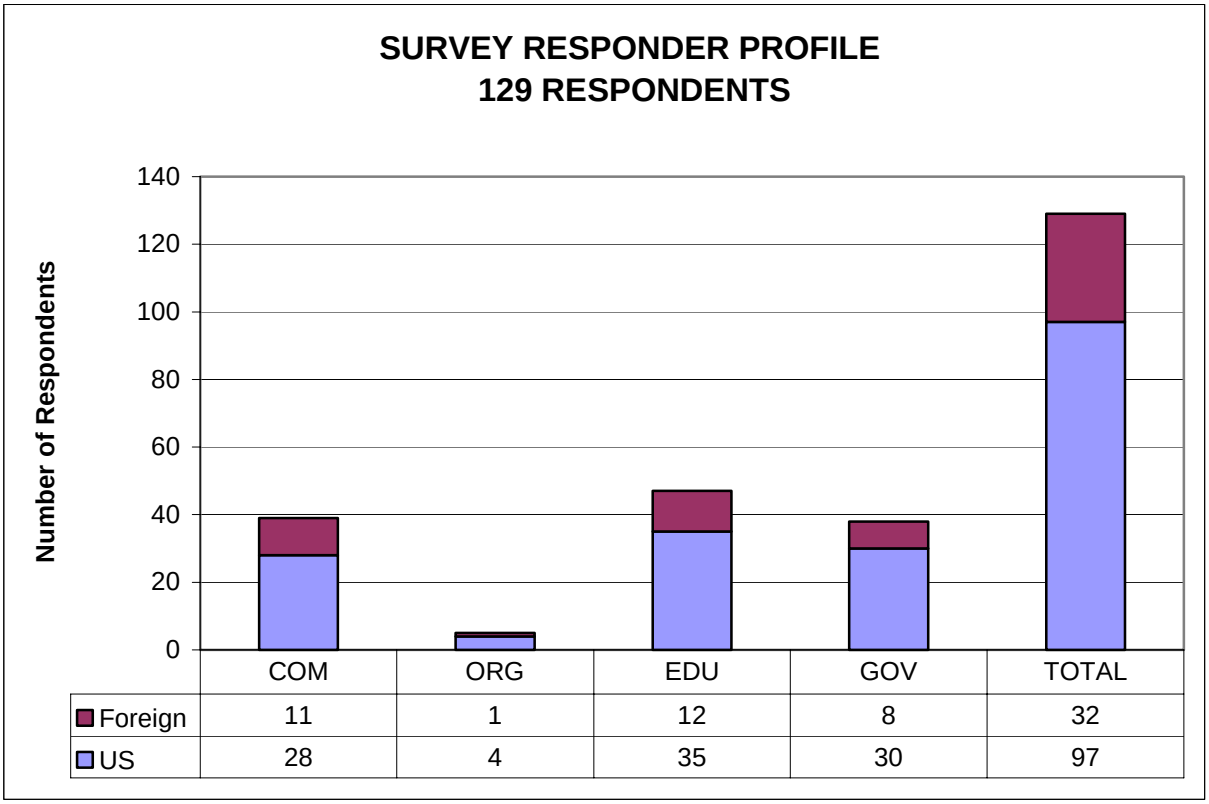
Section 1:

The data, who purchased it, who is the end user, what it is used for?

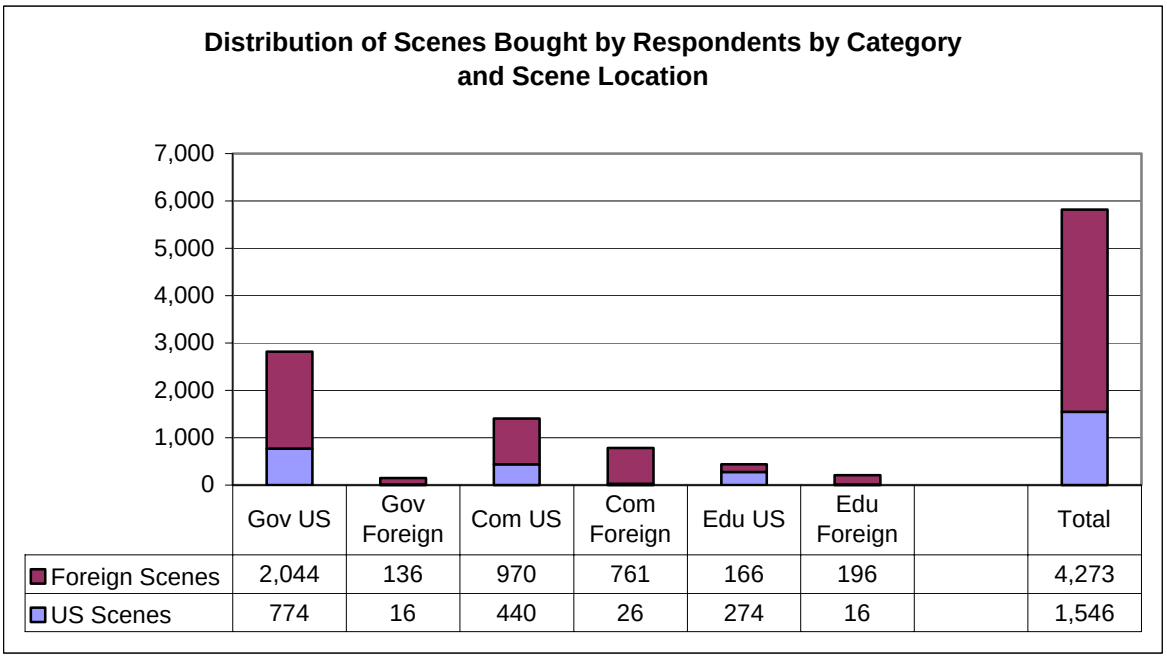
A. Organization

My Organization



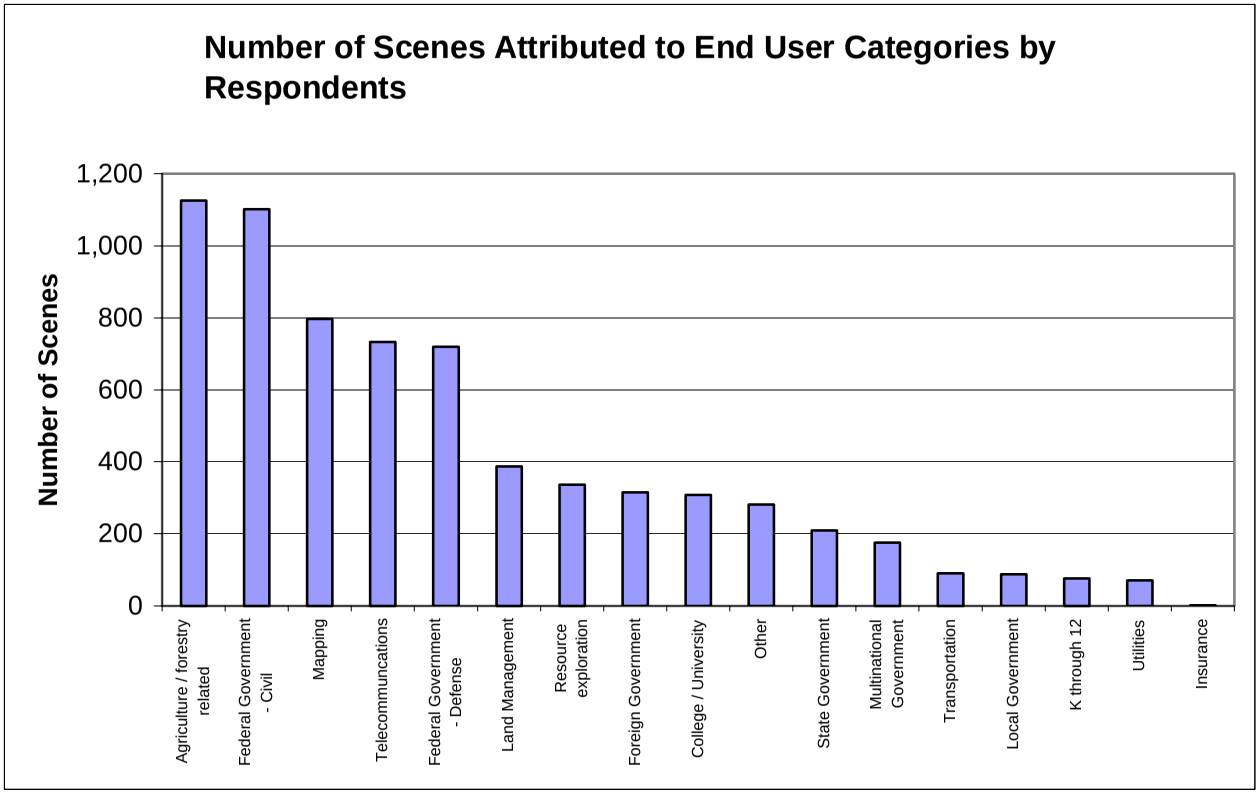
	COM	ORG	EDU	GOV	TOTAL
Foreign	11	1	12	8	32
US	28	4	35	30	97

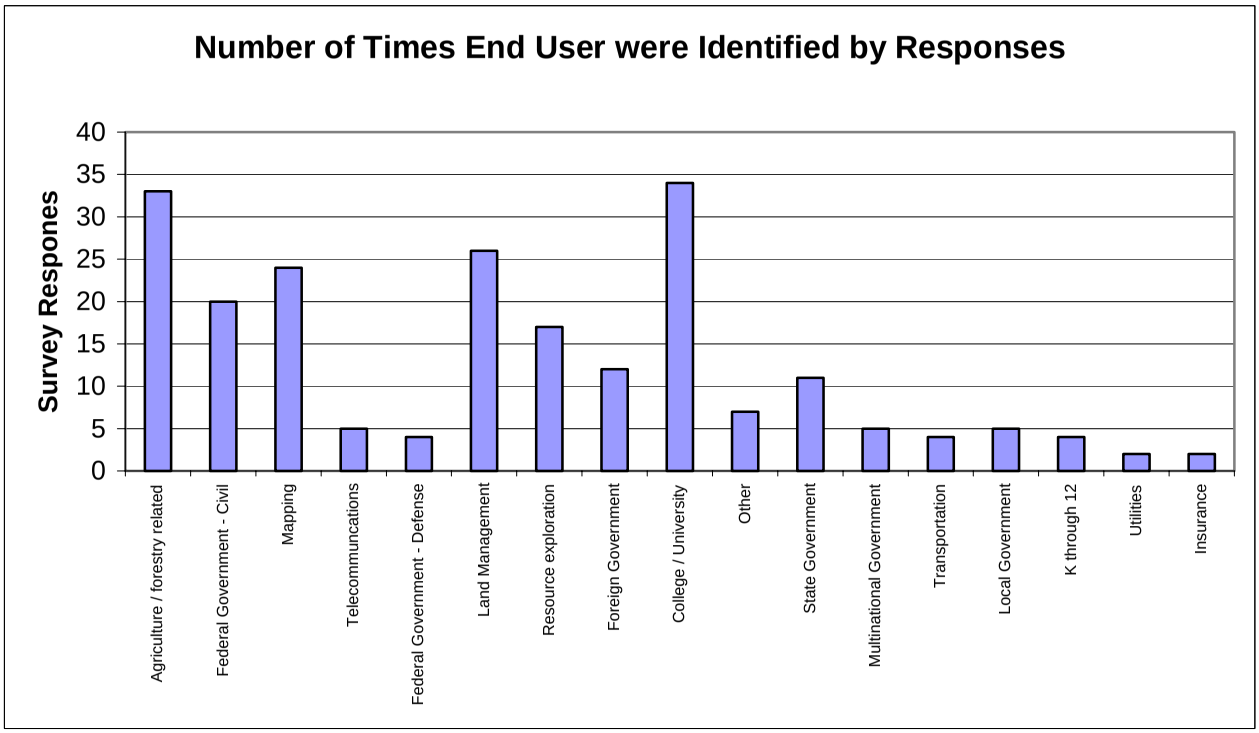
End User Organization



	Gov US	Gov Foreign	Com US	Com Foreign	Edu US	Edu Foreign		Total
Foreign Scenes	2,044	136	970	761	166	196		4,273
US Scenes	774	16	440	26	274	16		1,546

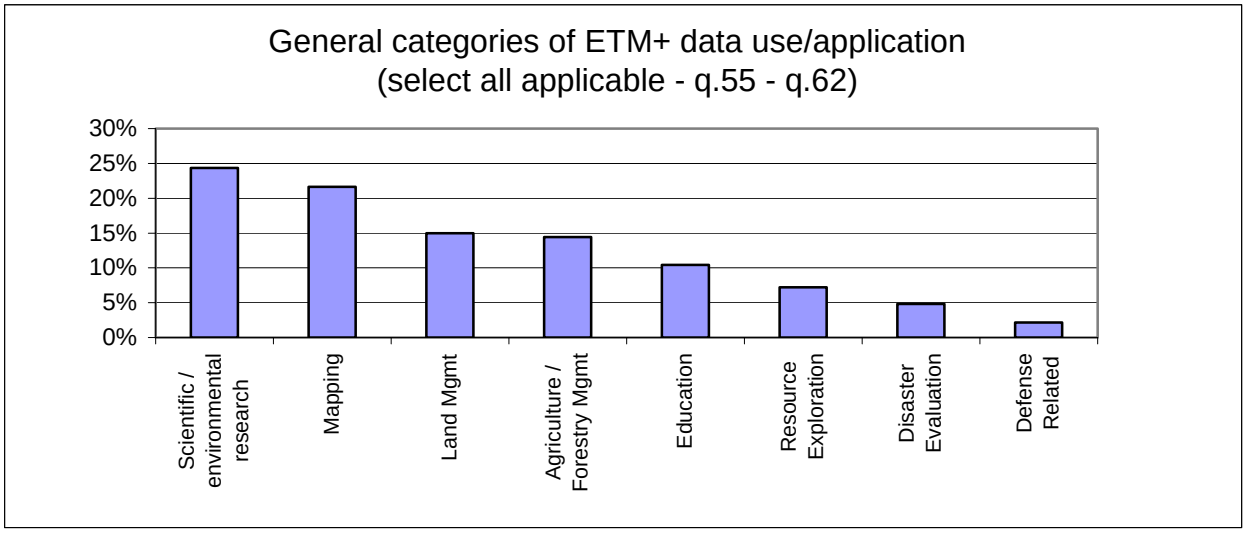
Number of Scenes





B. Select from the list all the general categories of ETM+ data use/applications for the Landsat 7 data:

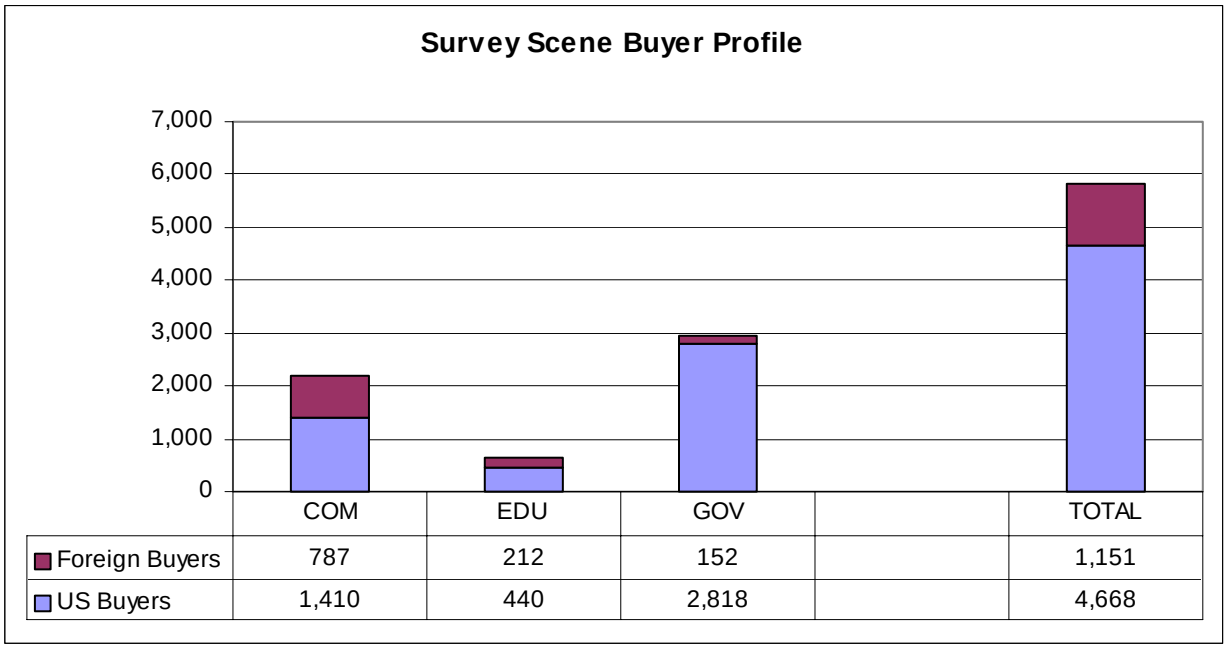
- Scientific / environmental research
- Land Management
- Agriculture / Forestry Management
- Mapping
- Resource Exploration
- Disaster Evaluation
- Defense Related
- Education
- Other

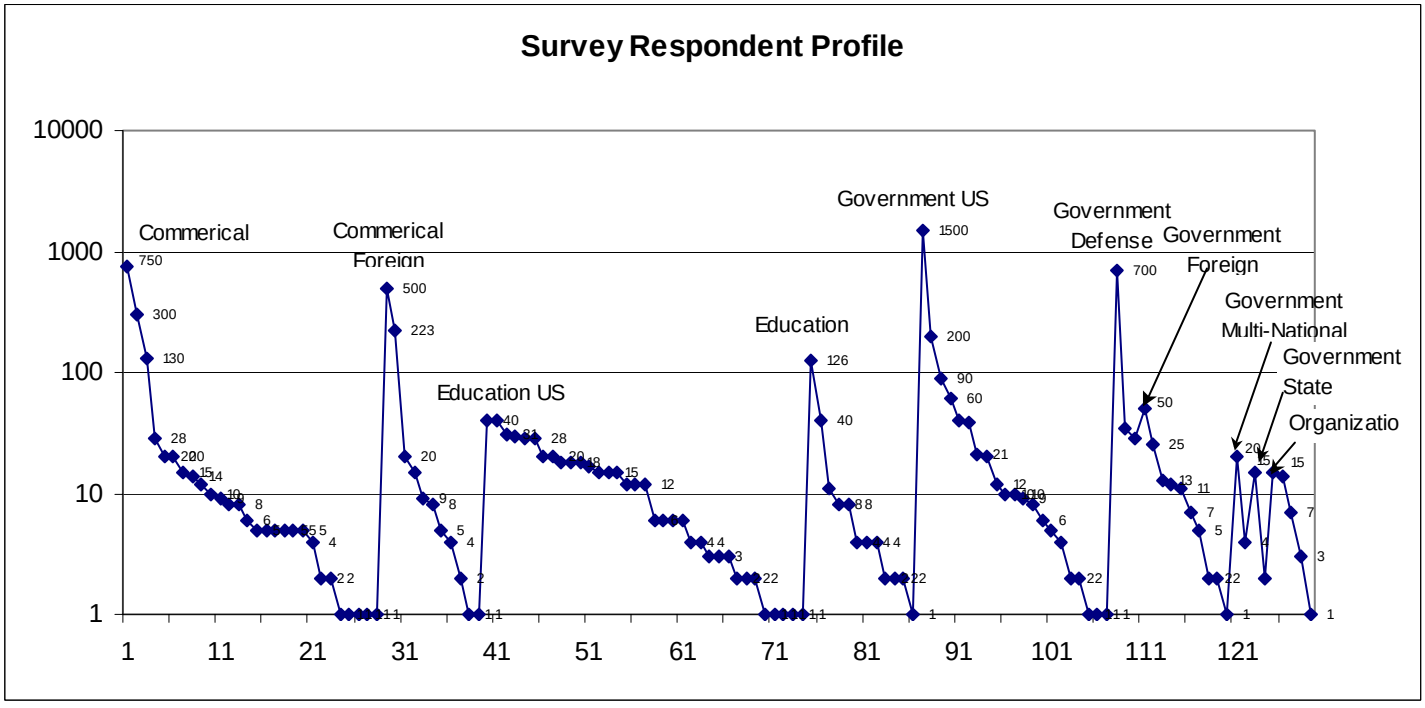


No Comments requested for this question.

Section 1: continued

C. Number of scenes purchased from EDC since October 01, 1999





Scenes	Number
Level 0	**45**
Level 1	**4,690**

D. Scenes purchased from foreign sources or elsewhere?

Foreign Source	# of Scenes
CONAE- Argentina, EURIMAGE-Italy	500
USDA FAS Image Library (USDA licensing)	225
Space Imaging, Euromap, NASDA, ESA	120
Tropical Rain Forest Information Center	100
Radarsat International	50
Space Imaging, Orb-Image	50
Eurimage, Radarsat	30
Radarsat International inc. and Eurimage	25
Eurimage	22
Japan, Australia	20
ACRES, Australia	15
SPOT, ERS	15
CLIRSEN-Ecuador	12
Geoambiente	12
University of Maryland - GLCF	12
Spot	11
Radarsat, SPOT	7
Satellite Applications Centre, South Africa	6
Brazil	5
GAF, Eurimage	5
INPE	3
Radarsat International/TRFIC	3
Contractor	2
DLR, Germany	2
Satellus, Swedish Space Corporation	2
International Ground Stations	1
Total	1,255

E. Anticipated number of ETM+ scenes to be purchased next year?

Scenes	Number
U.S Scenes	3,688
Non-U.S. Scenes	6,178
Total	9,866

No Comments requested for this question.

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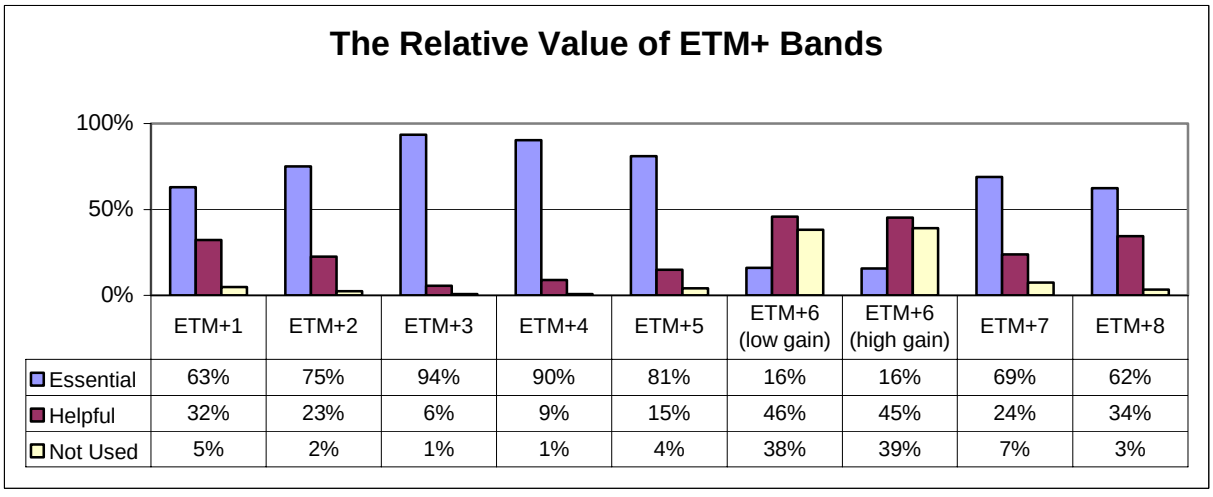
Section 2. Sensor-Related Questions

1. **Spectral Content and Band Resolution (rank the relative value of the bands used for your applications)**

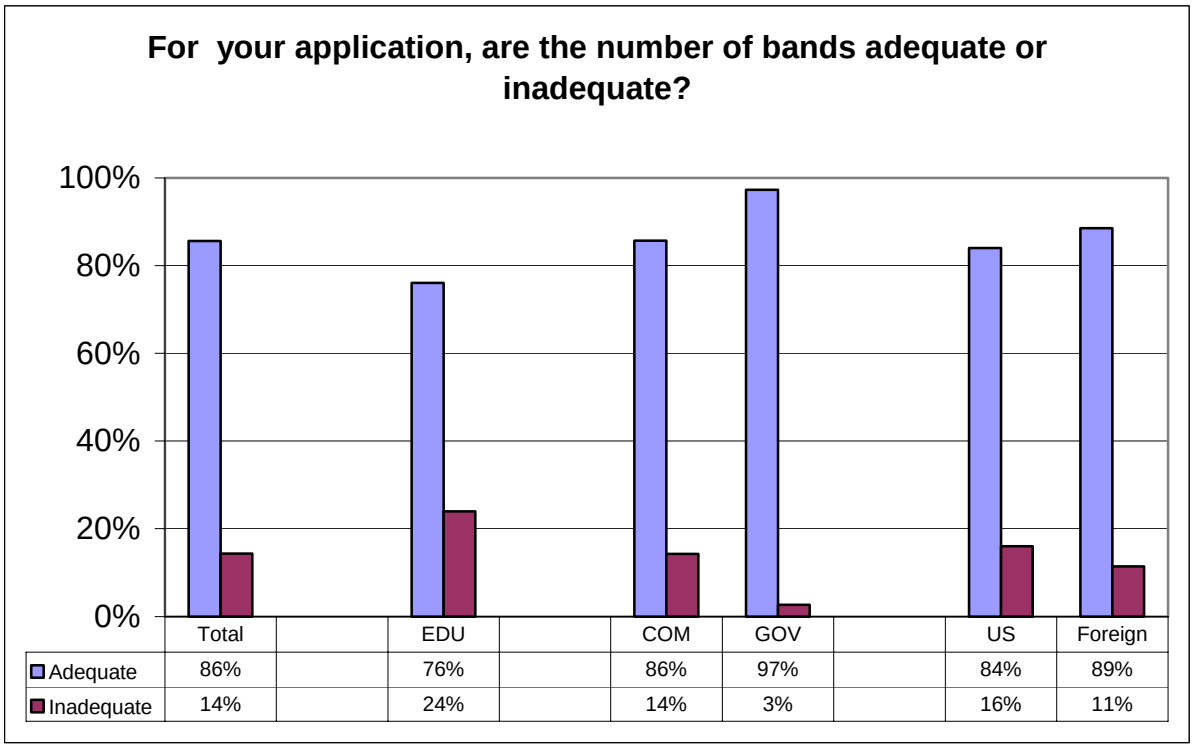
BAND	Frequency
ETM+1	. 0.450 - 0.515
ETM+2	0.525 - 0.605
ETM+3	0.630 - 0.690
ETM+4	0.775 - 0.900
ETM+5	1.550 - 1.750
ETM+6 (low gain)	10.40 - 12.5
ETM+6 (high gain)	10.40 - 12.5
ETM+7	2.090 - 2.350
ETM+8 (pan band)	0.520 - 0.900



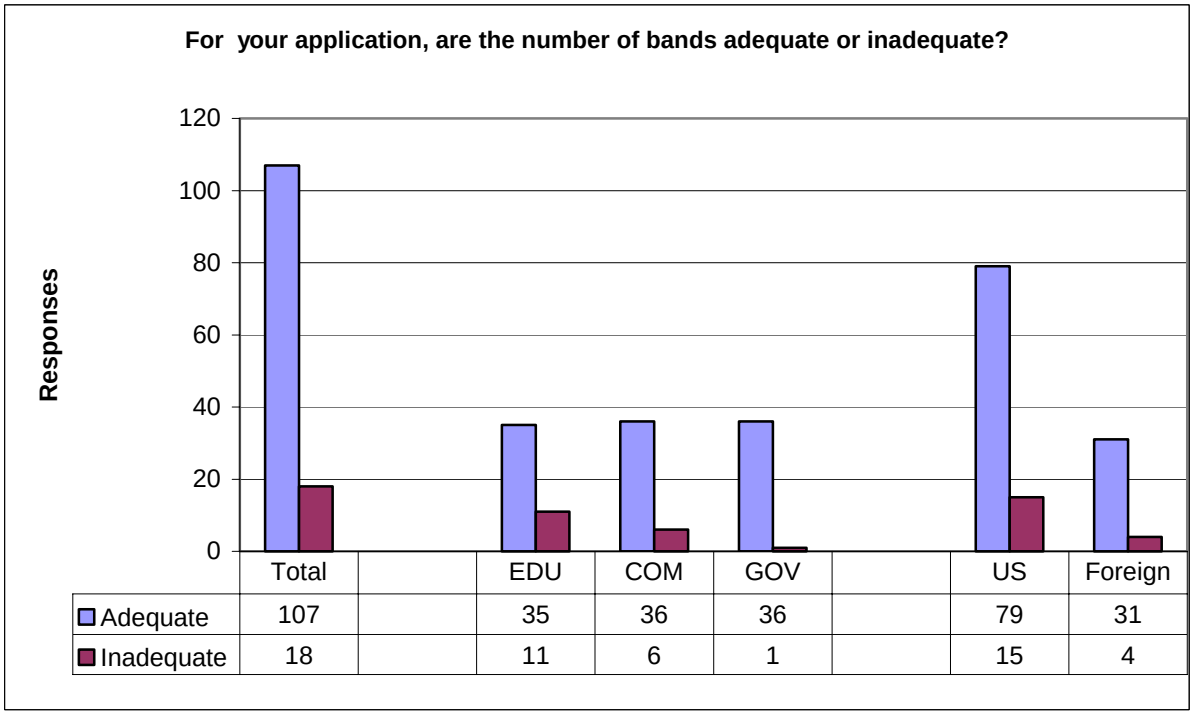
	ETM+1	ETM+2	ETM+3	ETM+4	ETM+5	ETM+6 (low gain)	ETM+6 (high gain)	ETM+7	ETM+8
Essential	63%	75%	94%	90%	81%	16%	16%	69%	62%
Helpful	32%	23%	6%	9%	15%	46%	45%	24%	34%
Not Used	5%	2%	1%	1%	4%	38%	39%	7%	3%

ETM+ Evaluation: continued

For your application, are the numbers of bands adequate or inadequate?



	Total		EDU		COM	GOV		US	Foreign
Adequate	86%		76%		86%	97%		84%	89%
Inadequate	14%		24%		14%	3%		16%	11%



	Total		EDU	COM	GOV		US	Foreign
Adequate	107		35	36	36		79	31
Inadequate	18		11	6	1		15	4

For your application, are the numbers of bands adequate or inadequate?

Comments:

ADEQUATE	Origin
Improved data with more bands in the Short wave infrared region will be very useful for our applications.	COM
More bands with finer spectral distinction would be useful.	COM
Adequate for a majority of applications, but not all.	GOV
Although we have not yet used Hyper spectral data, we believe it would also be very useful	GOV
An additional high-resolution band the visible red (or green-red panchromatic) would be useful.	EDU
ETM had been an extremely reliable and crucial tool for my organization, but we are definitely interested in increased spectral resolution.	GOV
Finer spectral resolution would be useful.	EDU
For land use and forest mapping, the spectral resolution is very good.	COM
Greater spectral resolution would be very useful.	EDU
However, it would help me if there were three carefully chosen bands in the 2.090-2.4 area	COM
If more bands were available in the visible and NIR spectrums this would have been extremely useful and valuable (for more precisely identifying and estimating vegetation parameters)	EDU
It is essential for us to have multiple bands, at least one in the IR and one in the visible. Multiple visible and IR bands are helpful, though.	EDU
It would be nice to have finer spectral resolution in the NIR Region.	GOV
Just right now.	GOV
More bands to increase geological discrimination might be helpful, but not at increased cost per scene, at least to this purchaser	EDU
Most of my work is done with the multi-spectral bands.	GOV
Most training/education applications are covered fine with these bands. We do have a few researchers that are interested in more and narrower bands for better discrimination of vegetation in arid regions.	EDU
No comment	GOV
Our primary reason for neglecting the ETM+6 bands is the lower resolution. If the resolution of these bands can be matched to the 1-5,7 bands they would probably be very useful.	COM
The colors of the combined bands were completely different from the thumbnail image in the search engine!!! It took too much time to get technical support. I am very disappointed!	COM
The critical bands for agriculture monitoring are bands 3,4,5.	GOV
The ETM+8 band has been an indispensable addition to the Landsat data due to the increased resolution	EDU

ADEQUATE	Origin
The more the better! We have found very appreciable the good sampling of the visible domain. More mid infra-red measures would be valuable for vegetation related studies.	GOV
The number of bands and the spectral characteristics are adequate because our primary purpose is to detect land cover change between multi-date scene pairs. Thus, comparable spectral bands are a requirement.	GOV
The number of bands is adequate but more would be helpful.	EDU
There may be additional applications for quasi-hyper spectral data, but the existing bands a good for the existing applications.	COM
TM applications are very well documented in literature. The high resolution ETM+8 band is useful in hardcopy form for geological structure analysis but is not a suitable replacement for SAR textures for interpretation of geological structure.	GOV
Until I have the chance to work with some hyper spectral data, it's hard to know whether more and narrower bands will help. I'm itching to get my hands on some hyperion data for my area of interest, but I haven't yet investigated the cost...	EDU
Very adequate for our purposes	EDU
We do oceanographic analyses of imagery. Therefore it is essential that we have true color bands available. The higher-resolution PAN band, when merged with other bands, enables us to pull out features not seen at 30-m res. Band 5 is used to determine the water/land boundaries while other band combinations enable us to extract other information (e.g., salt content left behind by water at high tide).	GOV
Why maintain band 6? Is really useful?	COM
Yes, we find Landsat 7 ETM+ data to be critical to K-12 education programs related to a variety of fields and programs. It is essential that Landsat remain a viable program from our perspective.	EDU

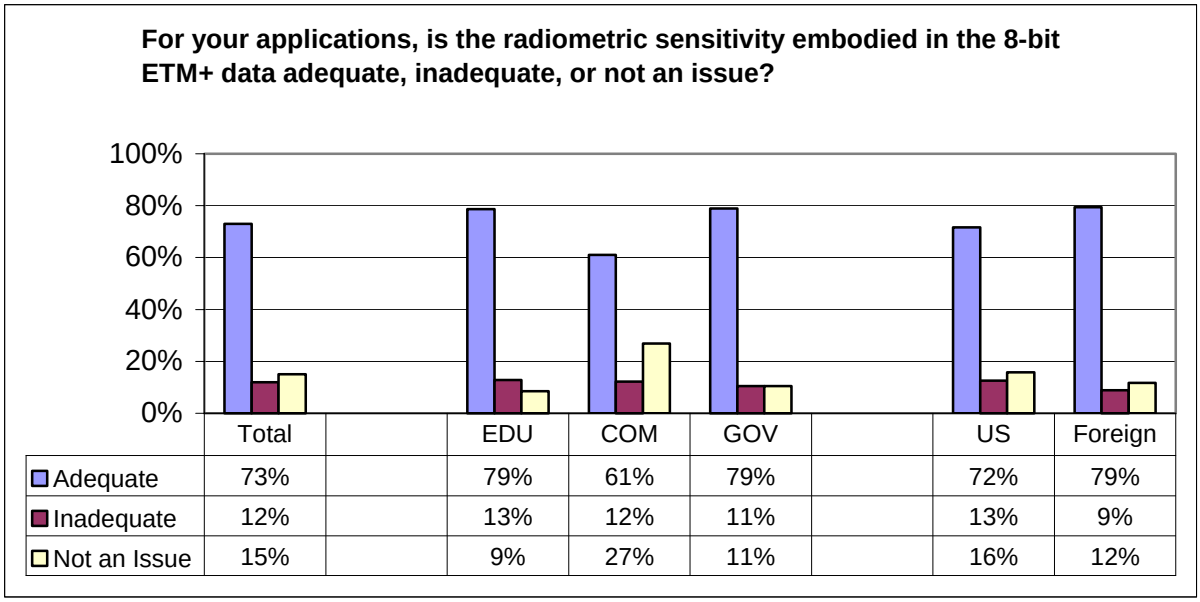
INADEQUATE	Origin
The more bands I get the better it is for making rock alteration maps for mineral exploration.	COM
6 reflective bands are the bare minimum number of spectral bands necessary for mineral mapping. I do hyper spectral mineral and vegetation mapping, so the more bands there are, the better. More bands = more accurate material ID Bands should have very small FWHM band pass and small, even sampling interval	GOV
a higher number of bands would improve the classification	
Additional narrow bands, including multi-spectral thermal would help greatly.	EDU
Cloud cover is major limitation of my research.... slap a radar sensor on there and then we're talking! Also.... pan band pixels are not consistent with pixels from other bands.... that sucks!	EDU

INADEQUATE	Origin
For detailed modeling work (reflectance/spectroscopy models), the number of bands is simply inadequate.	EDU
For estimating chlorophyll concentration in water, would be better to have more fine spectral resolution within the visible part of the spectrum.	EDU
Higher spectral resolution would be useful for land cover determinations	COM
Instead of one relatively broad LWIR band (6), would like to have two (better yet four) narrower LWIR bands, with spatial resolution the same as current one (60m) or finer.	COM
It would be much more useful to split the existing visible and NIR bands (except ETM+8) into two bands (with more narrow bandwidths). This would allow users to recombine them (to simulate legacy bands and bandwidths) as well as to take advantage of better spectral resolution. Also, a red-edge band (centered at 715 nm) should be added.	
My application actually requires Hyper spectral data for comparison to L7.	
Need several bands in the MWIR 3 - 5 um area as well as splitting the ETM+ 5 & 7 bands into two bands in each of the SWIR areas. See the original Landsat 6 studies for info on the TIR areas.	COM
Technology should be able to support more finer bands.	EDU
These bands are crucially needed for data continuity for algorithms already created. However, there are many problems for which algorithms have not been created because the necessary hyper spectral bands are not available to us yet. I need hyper spectral data in the 0.4-2.5, 3.0-5.0, and 8-14 micrometer wavelength regions. These will add to, but NOT REPLACE the algorithms, which work with current ETM bands. DO NOT DROP ANY ETM bands, with the possible exception of band 8.	EDU
Underwater Bottom Habitat classification would benefit from more bands in the visible range.	EDU
We rarely use the thermal band, but could use additional bands in the IR portion	EDU
We work in areas of the Amazon, which have extremely complex landscapes and cover types. In that particular area, many agricultural tree crops are spectrally similar to the surrounding forest. ETM+ data does not provide a high-enough spectral resolution to easily distinguish these cover types.	EDU
We would like more bands in the SWIR	COM
Would like to see bands, which will help reveal faults/fracture zones.	COM

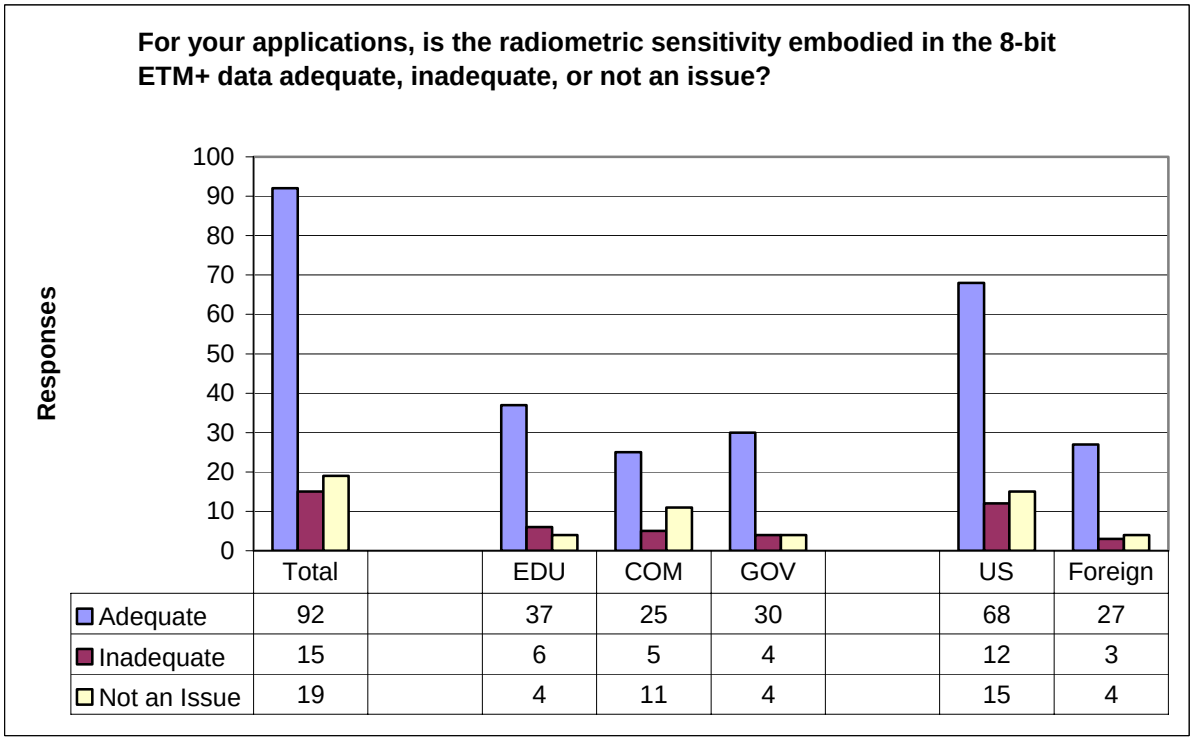
NO RESPONSE	Origin
Another Near IR band would be useful	GOV
We are not ready to provide a good answer to this question.	EDU

Radiometric calibration, accuracy, and sensitivity:

For your applications, is the radiometric sensitivity embodied in the 8-bit ETM+ data adequate, inadequate, or not an issue?



	Total		EDU	COM	GOV		US	Foreign
Adequate	73%		79%	61%	79%		72%	79%
Inadequate	12%		13%	12%	11%		13%	9%
Not an Issue	15%		9%	27%	11%		16%	12%



	Total		EDU	COM	GOV		US	Foreign
Adequate	92		37	25	30		68	27
Inadequate	15		6	5	4		12	3
Not an Issue	19		4	11	4		15	4

For your applications, is the radiometric sensitivity embodied in the 8-bit ETM+ data adequate, inadequate, or not an issue?

Comments:

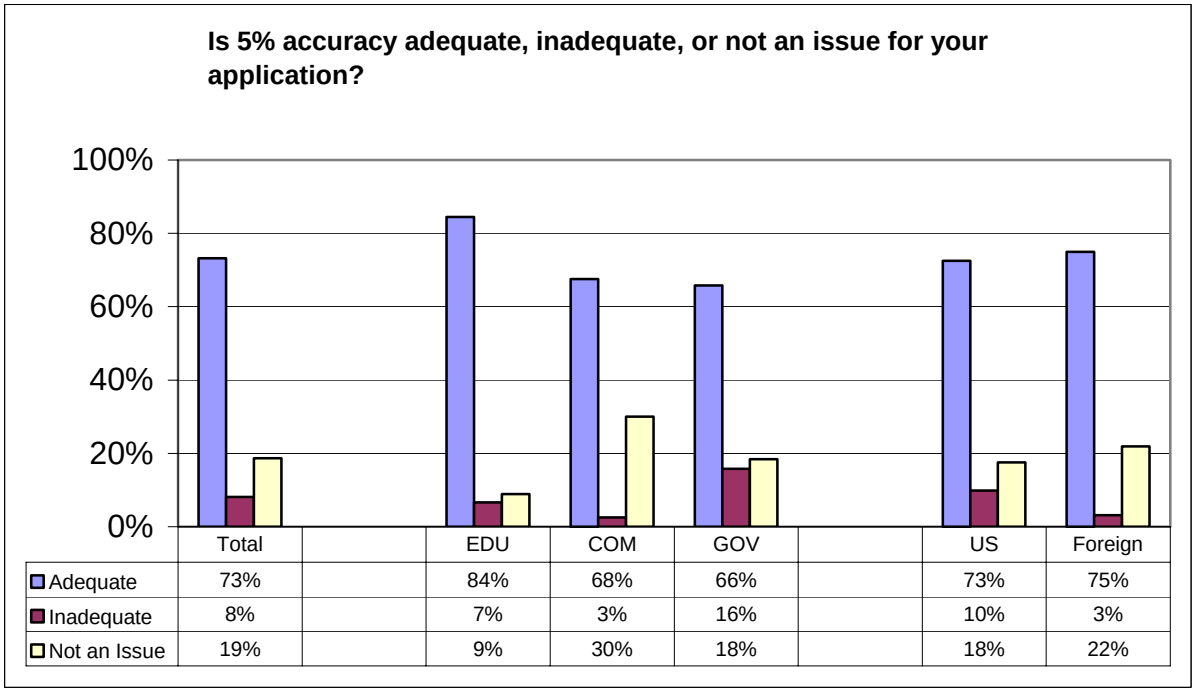
ADEQUATE	Origin
10 bit would be better especially in terms of saturation problems and determining different vegetation and crop types especially for determination various vegetation types	COM
Adequate for my land applications but we can always use better for water. Problem is our (dark) lakes are often too small for the spatial resolution of ETM+, so I've backed off most of the potential water applications.	EDU
Finer radiometric resolution would be useful.	EDU
For some applications, improved radiometric resolution is required. For other applications, 8-bit data with gain ranges as presently provided is adequate.	GOV
Higher quantization (16-bit, etc.) would be an improvement, but the 8-bit is pretty good.	EDU
I would prefer to use the higher radiometric resolution that is present in ETM+ and that is retained in the Level 1R product (HDF using 16-bit integers). A BIG problem in using Level 1R is that Level 1R has significant geometric flaws (offsets). Level 1G is good geometrically; but, the radiometric data are degraded by having only 8-bit integers available in Level 1G. The obvious solution would be for the USGS (government) to retain the 16-bit integer precision of the radiometric (radiance) data as they move the lines and pixels around to achieve geometric precision. I would call this Level 1GR ... GR for geometrically and radiometrically precise ... or GR for GReat!.	COM
In principle, it is accurate. However, we are using the data to study clouds. With the high gain settings normally in use, the radiances measured for cloud- covered portions of the scenes are often saturated. This makes the data much less useful.	EDU
It is very useful for interpreting vegetative interference.	GOV
No complains form us of from our clients	COM
Sufficient, although it seems to us that the sensitivity, and the image contrast, is a little bit lower than that of CCD sensors such as Spot. This is however balanced by the richer spectral information.	GOV
The high radiometric quality of ETM+ is, for land cover product validation needs, probably the most useful and important aspect of ETM+. Formation flying with Terra is also a significant advantage.	GOV
There is no true way for a user to know whether the albedos calculated from the DN are true or not ... since we are dependent on the bias and gain factors given in header file.	EDU
TM 7 is a great improvement over TM 5, but improvements are always welcomed.	GOV

INADEQUATE	Origin
See above!!!	COM
11 - 12 bit data would significantly improve the value of Landsat data. This is based on experience working with IKONOS MS 11 bit data.	COM
11-bit radiometric sensitivity would be an enormous advantage	GOV
A better sensitivity in the lower values of the channels 1-3 and 8 would be appreciated for water application purposes.	GOV
Digitization noise is often a problem. I checked an image from Sep 1999 at Lat -43 deg: averages for bands 1,2,3,4,5,7 are 58, 39, 32, 55, 40 & 25; but white sand was 160 to 220 in all bands. To cope with dark areas in the image, e.g. rainforest & etc I need 1 or 2 more bits, i.e. 9 or 10 bits. I know that this is a bit ask, but it is now not just AVHRR in this area - IKONOS has made the use of 10 to 12 bits more common.	COM
Higher sensitivity for radiometric surface temperature determinations will be necessary in the future	COM
I am concerned that not all Landsat data, including L4 and L5, are calibrated in the same manner, which makes long-term change detection results questionable.	EDU
Radiometric data is not part of the GEOTIFF format, and should be. Users who download Geotiff data from EDC cannot convert their data to radiance, because this information isn't provided, but should be.	GOV
We need 10 or 12 bit data.	EDU

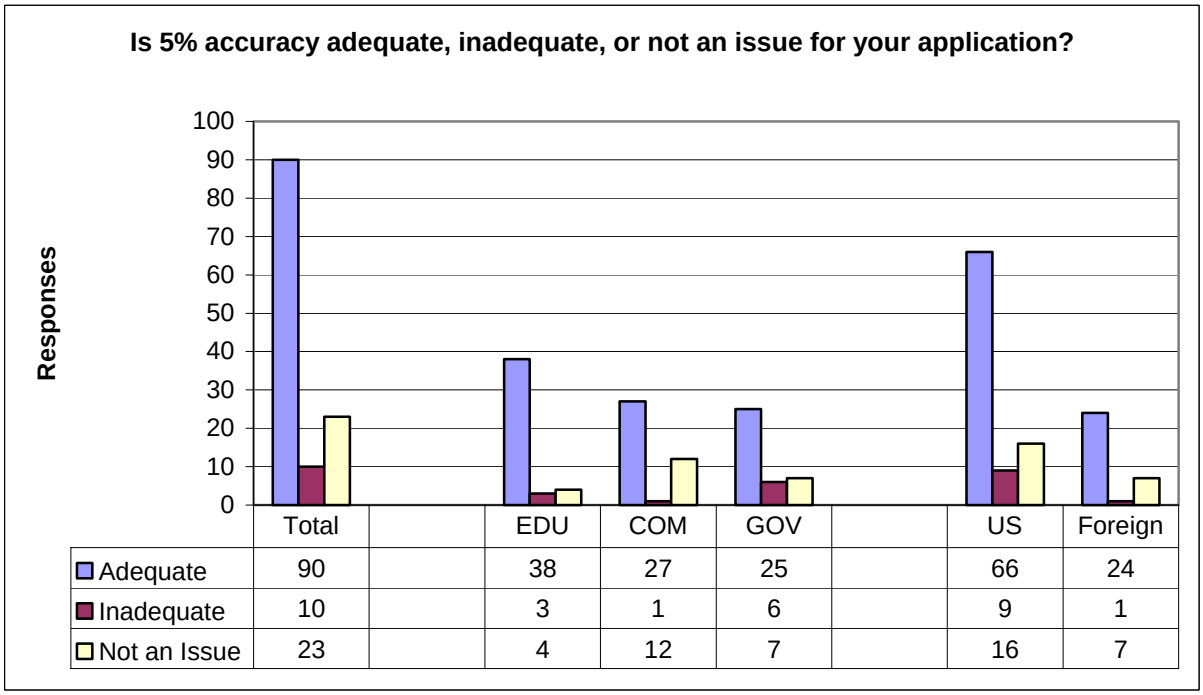
NOT AN ISSUE	Origin
My work is temporal.... radiometric sensitivity in one sensor is great, however temporal inconsistencies with other "radiometrically corrected" datasets have inconsistent values!	EDU

Radiometric calibration, accuracy, and sensitivity: continued

Is 5% accuracy adequate, inadequate, or not an issue for your application?



	Total		EDU	COM	GOV		US	Foreign
Adequate	73%		84%	68%	66%		73%	75%
Inadequate	8%		7%	3%	16%		10%	3%
Not an Issue	19%		9%	30%	18%		18%	22%



	Total		EDU	COM	GOV		US	Foreign
Adequate	90		38	27	25		66	24
Inadequate	10		3	1	6		9	1
Not an Issue	23		4	12	7		16	7

Is 5% accuracy adequate, inadequate, or not an issue for your application?

Comments:

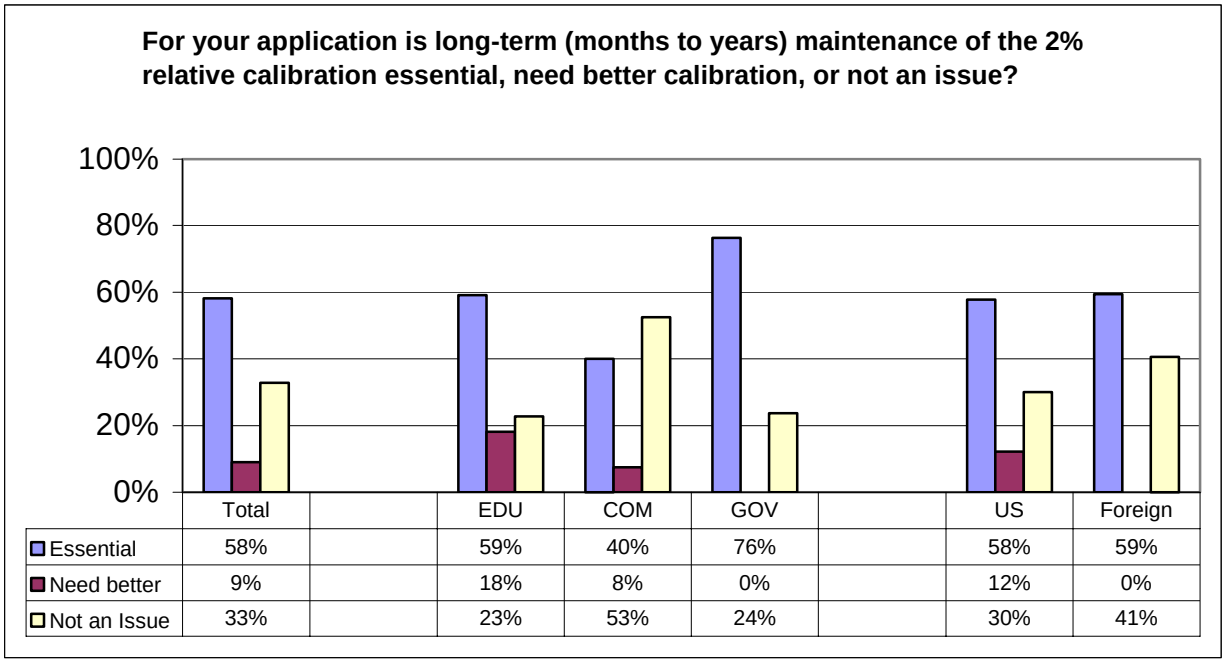
ADEQUATE	Origin
We commonly rely on being able to compute reflectance images so radiometric accuracy is important.	COM
2% would be better 1% would be great	EDU
Adequate	EDU
At least I think so...	EDU
But could be better	COM
Could be better.	EDU
For some applications, improved radiometric accuracy is required. For other applications, accuracy is not a major issue.	GOV
Improvements would always be welcome.	EDU
No complaints from us or from our clients	COM
The quantitative information that I produce from ETM+ involves subtle changes in apparent reflectance among bands (differences between bands or differences in multi-band feature space). A big problem with the automatic scale change from 16-bit integer values to 8-bit integer values is that some scene objects are very bright (clouds, snow). The automatic conversion process assigns 255 to the brightest pixel (which may be a cloud). This causes the data range over land to be very small (perhaps as low as a DN range of 30-100 counts only).	COM
Vegetation signatures change daily, seasonally and annually with the life cycle growth. Maintenance of a the radiometric accuracy standard is important for interpreting vegetative life-cycle change, i.e. vegetative interference when interpreting soils, lithology, alteration, geological structure, dynamic change, etc.	GOV

INADEQUATE	Origin
Spectral mixing analysis is critical of radiometric value…. the higher the radiometric accuracy, the better my results	EDU
We use TM 7 for change detection studies, so accuracy is an important consideration.	GOV

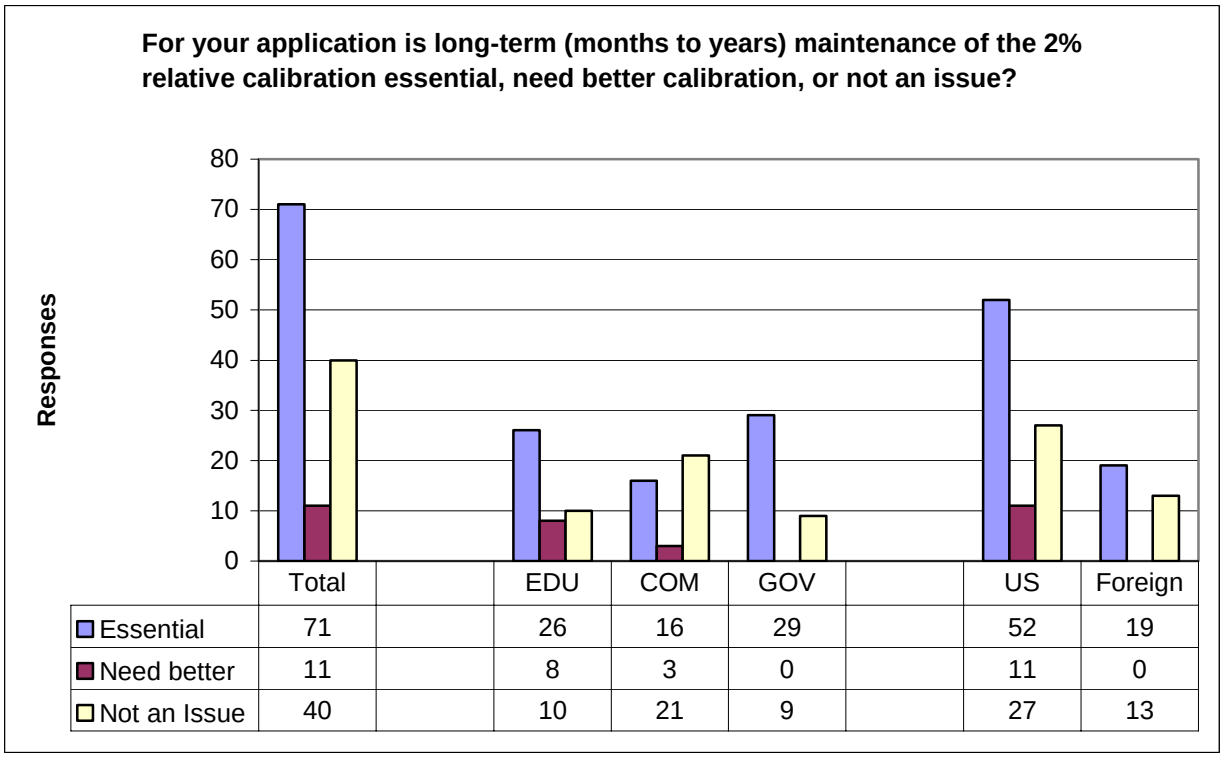
NOT AN ISSUE	Origin
Not sure	EDU
Only relative calibration is an issue for us.	GOV
ETM radiometric accuracy should be kept as is and not lowered.	EDU
Higher accuracy will be important for radiometric surface temperature studies	COM
We are not ready to provide a good answer to this question	EDU

Radiometric calibration, accuracy, and sensitivity: continued

For your application is long-term (months to years) maintenance of the 2% relative calibration essential, need better calibration, or not an issue?



	Total		EDU	COM	GOV		US	Foreign
Essential	58%		59%	40%	76%		58%	59%
Need better	9%		18%	8%	0%		12%	0%
Not an Issue	33%		23%	53%	24%		30%	41%



	Total		EDU	COM	GOV		US	Foreign
Essential	71		26	16	29		52	19
Need better	11		8	3	0		11	0
Not an Issue	40		10	21	9		27	13

For your application is long-term (months to years) maintenance of the 2% relative calibration essential, need better calibration, or not an issue?

Comments:

ESSENTIAL	Origin
Consistently good calibration is important for our long-term, repetitive erage, to be able to study a region over a period of 15 or more years.	COM
Absolutely important for future change comparisons.	GOV
Absolutely. We are using Landsat to create fire severity data products. We are using a burn severity index and would like to be able to compare index values from fires of different years. We would hope that ground-truth burn severity data collected for current severity products could be extrapolated to burn severity products generated for fires 10 years from now.	GOV
Agriculture monitoring and production estimates require comparisons within seasons and between seasons to review change to baselines.	GOV
Consistency of images over time is important.	EDU
Especially for change detection in vegetated areas	COM
For our change detection efforts we need it maintained	GOV
For some applications, calibration stability is important. For other applications, it is not an issue.	GOV
I am doing seasonal and year-to-year analyses. Absolute calibration (in terms of band radiances) is essential at the 2% level of variation to allow for quantitative extracted information to be comparable from date to date.	COM
It would be difficult to prepare change images over time if the data calibration were not maintained. This is one of the main uses for the data archive.	EDU
No complaints from us or from our clients	COM
Since my projects involve long-term change studies, long term maintenance is important to me.	EDU
This is essential for quantitative change detection.	EDU
Time = $ The effort is well worth it for my work.... but as for that of others.	EDU
We are using TM 7 for long-term change detection.	GOV
We really need to compare scenes from year to year. 2% is un-doubtfully enough, but has to be guaranteed.	GOV
Yes, we are trying to compare a time series showing vegetation recovery in one of the world's "great" mining damage zones. Tough enough with the atmosphere changes between images. At least if the instrument calibration stays constant, it's one less thing to worry about.	EDU
Yes, we plan to consider development of ETM based change detection. This will be performed within a given years 6 month period and between years.	EDU

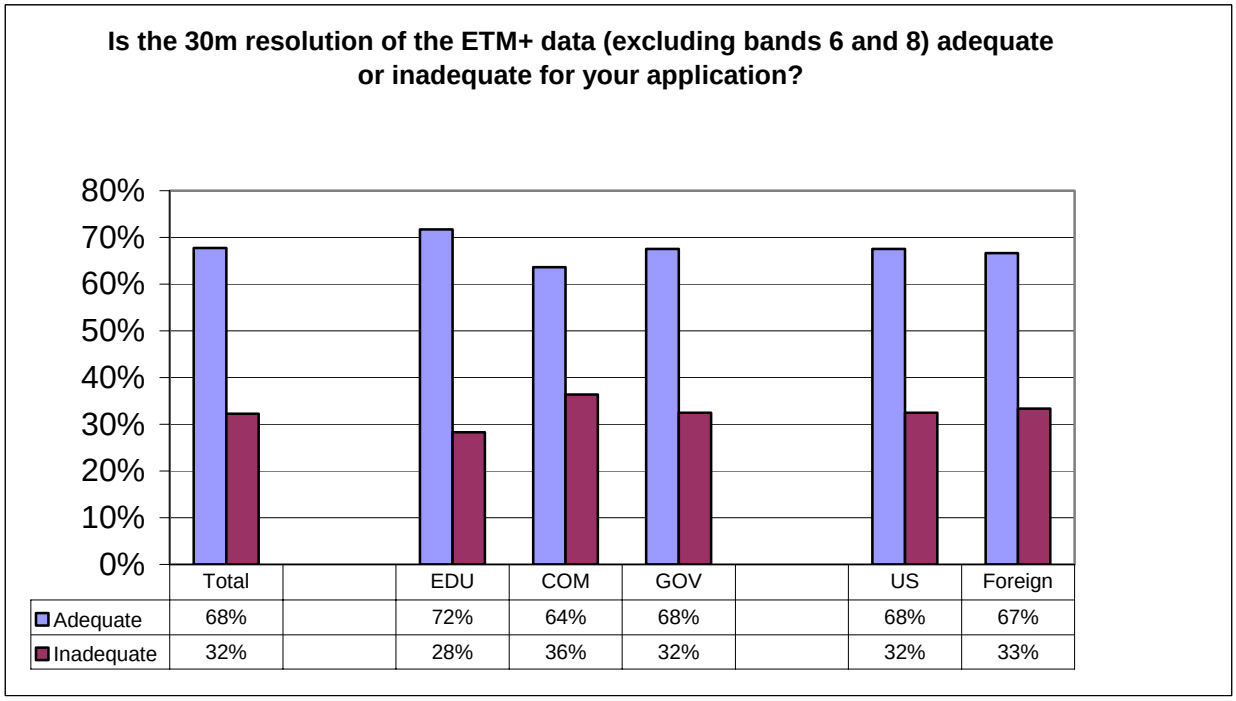
NEED BETTER CALIBRATION	Origin
Better calibration would benefit my multi-temporal studies.	EDU
Constant calibration over years is certainly useful for comparisons over time	EDU

NEED BETTER CALIBRATION	Origin
and change evaluation	
I correct for degradation through image processing schemes.	EDU

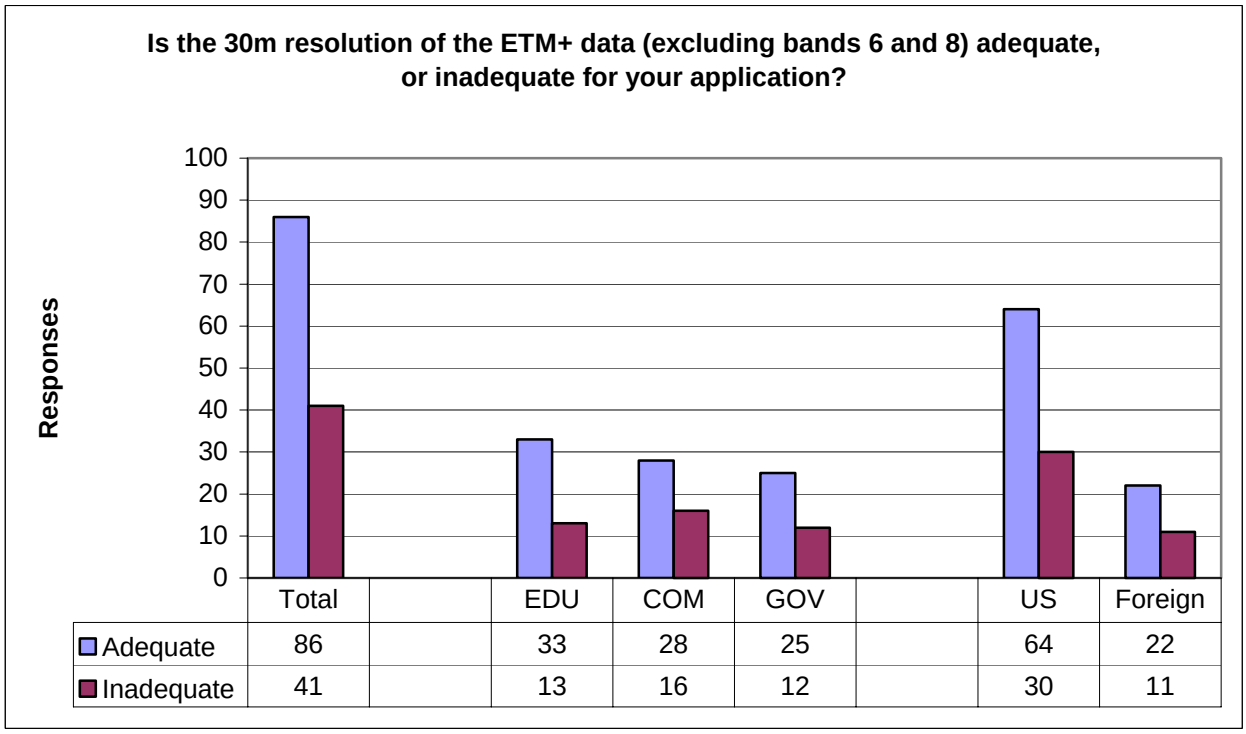
Section 3. System-related Issues

Spatial resolution:

Is the 30m resolution of the ETM+ data (excluding bands 6 and 8) adequate or inadequate for your application?



	Total		EDU	COM	GOV		US	Foreign
Adequate	68%		72%	64%	68%		68%	67%
Inadequate	32%		28%	36%	32%		32%	33%



	Total		EDU	COM	GOV		US	Foreign
Adequate	86		33	28	25		64	22
Inadequate	41		13	16	12		30	11

Is the 30m resolution of the ETM+ data (excluding bands 6 and 8) adequate or inadequate for your application?

Comments:

ADEQUATE	Origin
Will use 15-meter data if the cost is within $1000.	COM
A 20-m resolution could be more helpful	GOV
The more detailed the better	COM
10pan 20 multi spectral would be better	COM
20 m will be better	COM
30 M data copes with a wide range of applications. While higher resolution always opens up new applications, the accompanying higher cost would close off others. 30 m data will probably have a niche for many years. If higher resolution data was available for a similar cost, Landsat could pack it in; but that is not about to happen.	COM
30 m resolution is adequate, but obviously, the more I can see for mapping the better it is. Recourse to aerial photography is often necessary.	EDU
A smaller resolution would be most beneficial in our uses of Landsat7	COM
Adequate for a majority of applications, but not all.	GOV
As stated above - 30 meter has been useful for our applications that are mostly large area related, but we are also interested in increased spatial resolution.	GOV
As with everything higher spatial resolution is desirable. a 15m multi-spectral system would be great. At the present time L7 data are quite nice.	EDU
Better resolution is always appreciated, but 30m is not bad.	EDU
Better spatial resolution is always an advantage. There are some features (patch reefs) that are not visible due to the 30 m resolution. However, the trade off mentioned in the question is very real. I would not like to give up any temporal coverage, as there are many cloudy days where visible data are not available for a section of coast. Many of the scenes cannot be used for my application due to cloud cover. Thus, it would not help to have 5 m or 10 m ground resolution if I had fewer chances to get a clear day over a section of coastline.	EDU
ETM+8 requires too much disk storage so I don't routinely use it.	GOV
For some applications, improved spatial resolution would be of benefit. For most applications, 30 m is adequate but better resolution would be welcome but recognize there will be an increased data load. Current data volumes per scene are a good compromise.	GOV
Going from 80m MSS data to 30 TM data made a 10 fold increase in the number applications for Landsat. Higher resolution would be better but not at the same level of improvement.	COM
Having better spatial resolution would probably limit the swath and would increase the revisit period. I use other commercial sources for better resolution (costing much more than government-provided ETM+ data).	COM
Higher resolution would be nice	GOV
Higher resolution would be useful for vegetation mapping and monitoring	COM
However, higher-resolution is becoming more essential to our imagery analyses.	GOV
I consider it adequate, but it would be great if it could be improved	EDU
I do large area investigations. 28.5 m. Resolution is perfect at this time.	EDU

ADEQUATE	Origin
It is adequate although a better resolution would be appreciated; let's say 15-20 meters. It should however not affect the spectral resolution at all.	COM
It is adequate BUT it would be better if a higher resolution would be available (e.g., 10-20m)	EDU
Keep the 30 meter for change analysis with older TM data, but improving the resolution to 15 meter multi-spectral would be a great addition.	EDU
Resolution around 15-20 m would improve the applicability	GOV
Since our application is for wall-to-wall coverage of States during the crop season, 30 meters is just fine. Finer spatial resolution is not necessary for our applications. What we need is better TEMPORAL COVERAGE (8 days or better).	GOV
Sure, one always wants higher resolution. I'm trying to use ETM+ when I should have aerial photographs. However, for large areas the cost of higher resolution (2-5 m), both for acquisition and archival, goes into the trees, I assume.	COM
The 30m resolution is adequate. But the higher resolution of the pan band shows up much smaller features and enhances information gained from the 30m bands	EDU
The resolution is adequate, but higher spatial resolution would always be welcome.	EDU
We use ETM+ scenes for regional scale projects. At this point, higher resolution scenes over an area of 180km x 180km would become difficult to work with. ETM+ provides us with regional views, IKONOS provides us with detailed local views. However, in 2-3 years time, something like a 15m resolution would be a very desirable product.	GOV
We work with what is available. Better resolution is always a useful option in the future, but this would not permit the long-term studies to continue.	EDU
Well, of course 1 m resolution would be even more adequate!	GOV
While greater spectral resolution would obviously be a benefit, it is probably not necessary at global scales and would substantially increase the volume of data to be manipulated - often unnecessarily.	EDU
Yes, just barely for land applications. No for water applications...we have hundreds of small lakes and just cannot get enough clean (no land mixed in) pixels.	EDU

INADEQUATE	Origin
10 m would be preferred	GOV
An improved spatial resolution is preferred for landforms mapping and monitoring purposes. Fusion with the PAN band distorts in most cases the spectral characteristics of the multi-spectral image.	GOV
10 – 20 m would be better.	EDU
10 to 20 meter would be better for our mapping needs	GOV
15-m resolution would be better for some of the applications the data is used for.	XXX
30 meter pixels are far too large for most applications other than global change and coarse change detections for reefs/coastal/urban growth applications. 10-15m resolution is optimal, with smaller scene footprint. 2-8 meter pixels are better, with less spectral mixing, but is not realistic for a space borne sensor. However, there is a place for ETM+ in the pantheon of sensors, mainly in that it provides temporal continuity with older MSS and TM We have to start migrating toward space borne hyper spectral sensors, as these make TM largely obsolete in terms of material identification capability.	GOV

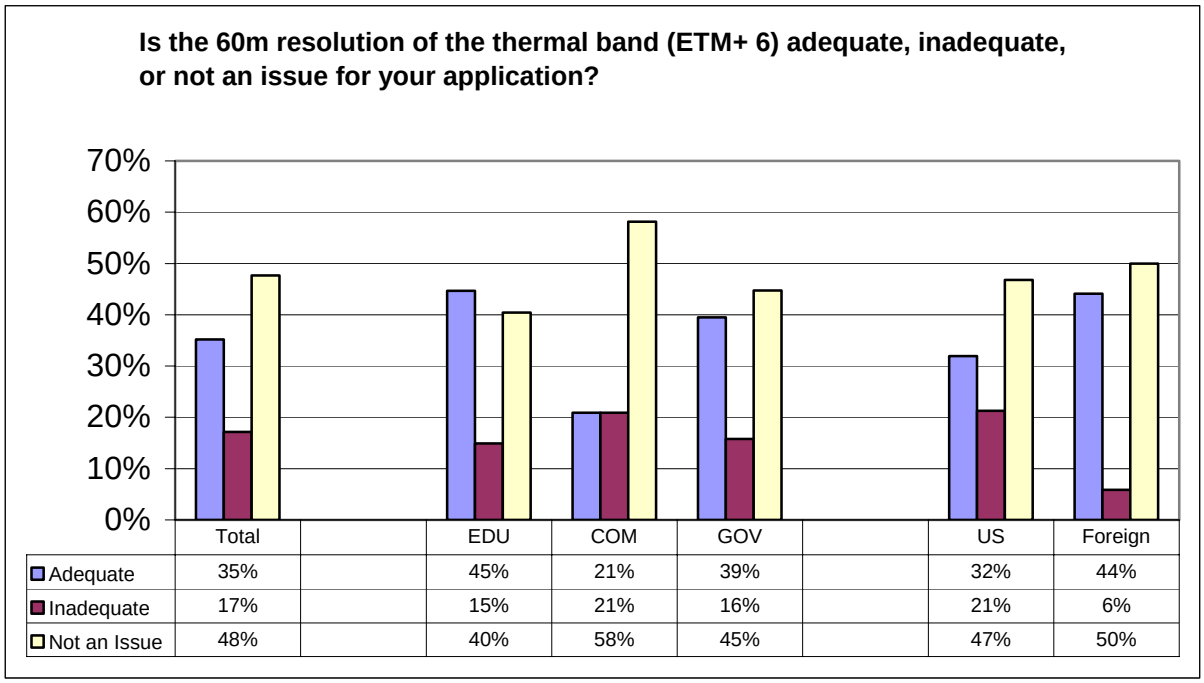
INADEQUATE	Origin
Agricultural application(s) are requiring <20m spatial resolution	COM
Always looking for higher resolution data for local/regional scale applications	COM
Better spatial resolution would be very useful; I had to obtain and use aerial photography with the imagery to get the information needed	EDU
Considering the price and referred to the 30m data is acceptable, but a higher resolution data set with comparable coverage and cost would be better. Cost is the primary driving force for continued use of L7 data!	EDU
Given the technical advances in sensor design, the next Landsat should be able to offer 15 meter resolution at the same or lower satellite cost without any loss of areas, radiometric sensitivity or resolution. 15 m MSI data would significantly enhance the value of Landsat with no threat to US commercial Remote Sensing companies.	COM
Higher resolution would be better	GOV
Higher resolution would be helpful. Had to use 4 meter from IKONOS satellite for some areas.	EDU
Higher spatial resolution would be helpful, though it is not as important as increased radiometric resolution or spectral resolution.	EDU
I'm not sure whether to tick inadequate or adequate.... Our choice of ETM+ versus SPOT-HRVIR or IRS-LISS was mainly due to the large size of scenes. Otherwise we would have had to perform mosaics of images, which is always painful and inaccurate. Yet, we encounter problems in classifying mixed pixels, certainly more often than with 10m or 20m data.	GOV
It is important to include a higher-resolution single channel. A panchromatic band for this purpose is adequate.	GOV
It would be nice to have a 15 meter Spatial Resolution for the RGB Bands used	COM
My country land use mapping is quite difficult with this resolution because of small size of farms etc.	COM
Please try to enhance it to 15 m for all of the bands	GOV
Prefer 10 – 15m	GOV
Sometimes OK, but improvement would widen range of applications	COM
The real answer would be adequate for now, inadequate for potential applications. We are using it for high resolution surface characterization of the surface to drive a weather forecast model concerned with small scale changes in the weather. For current applications the resolution is adequate. However, we wish the characterize urban areas and the street level "weather". For this application the resolution is inadequate. 5-10 meters would be referred.	COM
The spatial resolution of 30m for band 1,2,3,4,5 and 7 is inadequate. We use Landsat Thematic Mapper and many essential geological features occur below the 30 m resolution but can be well imaged using the 15m resolution that band 8 has. However, since band 8 is panchromatic, it would be very advantageous for Thematic Mapper if bands 1,2,3,4,5 and 7 would also be at 15m resolution. That would reduce the necessity to also acquire SPOT data to conduct Geological Survey type (and scale) mapping.	EDU
The system has to evolve to better resolution and maintain the same GRS and swath width.	COM

INADEQUATE	Origin
This is a naïve question. 30-m resolution is adequate for some problems, and higher spatial resolution is adequate for other problems. Worse spatial resolution is adequate for yet another set of problems. It scares me that whoever came up with this question may be judging the fate of future satellites and has no more knowledge of remote sensing applications than this. Like it or not, this is a complex issue.	EDU
We buy true color imagery from other sources of at resolution as low as 0.2 m—we will use the highest resolution on visible bands that we can find. The 30 m imagery is useful for backgrounds and large shots.	COM
We think that 10M data would be about right for our purposes.	GOV
Would prefer higher resolution	EDU
Would very much like to see sub-30 m resolution data	EDU

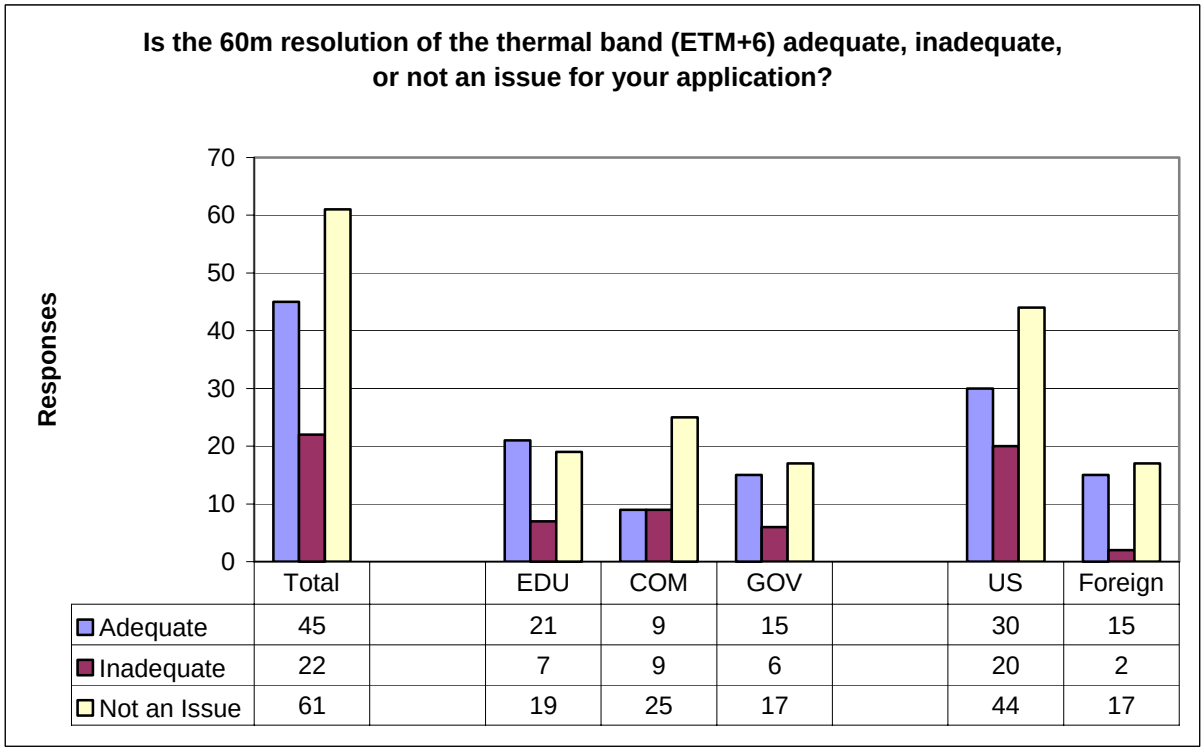
NO RESPONSE	Origin
Application dependant	GOV
Yes and no.... geographically/spatially, the consistence in spatial pixel extent in my dataset is important... greater pixel resolution COUPLED WITH HIGHER ACCURACY OF SATELLITE EPHEMERIS AND THEREFOR HIGHER ACCURACY OF PIXELS GEOGRAPHICAL LOCATION... would be most awesome!	EDU

Spatial resolution: continued

Is the 60m resolution of the thermal band (ETM+ 6) adequate, inadequate, or not an issue for your application?



	Total		EDU	COM	GOV		US	Foreign
Adequate	35%		45%	21%	39%		32%	44%
Inadequate	17%		15%	21%	16%		21%	6%
Not an Issue	48%		40%	58%	45%		47%	50%



	Total		EDU	COM	GOV		US	Foreign
Adequate	45		21	9	15		30	15
Inadequate	22		7	9	6		20	2
Not an Issue	61		19	25	17		44	17

Is the 60m resolution of the thermal band (ETM+ 6) adequate, inadequate, or not an issue for your application?

Comments:

ADEQUATE	Origin
30m pixels would be more useful	GOV
I think that enhancing the 60 m spatial resolution of ETM+ 6 would open new vistas for Landsat in thermal mapping and related applications.	GOV
30m thermal would be still more useful but may not justify the cost for most applications.	EDU
Again, a naive question. I can solve some problems with this but need better resolution for other problems. Satellites of many different types are needed, but LANDSAT TM should remain as is for continuity and other satellites should address other problems for other resolutions. We need a touchstone like LANDSAT TM, no matter what new satellites are forthcoming.	EDU
Finer spatial resolution would be nice, but expensive for taxpayers.	EDU
Helps on occasion for rice where flooded or wet fields have a temperature difference from surrounding crop fields.	GOV
Higher resolution would be nice	GOV
If there was better resolution it may be used more.	EDU
Little application.	GOV
Much more useful than the lower resolution thermal band on Landsat 5.	EDU
No comment	GOV
Not much as it does not fit with the 30 m resolution of the other bands	COM
Rarely used (only for hotspot analysis)	COM
The resolution is adequate, but higher spatial resolution would always be welcome.	EDU
To compare (or analyze) ETM+ 6 with other bands the same resolution could be better...	EDU
We have been looking at the thermal channels in relation to mining (coal fields) and a smaller resolution may assist us in assessing its ability.	COM

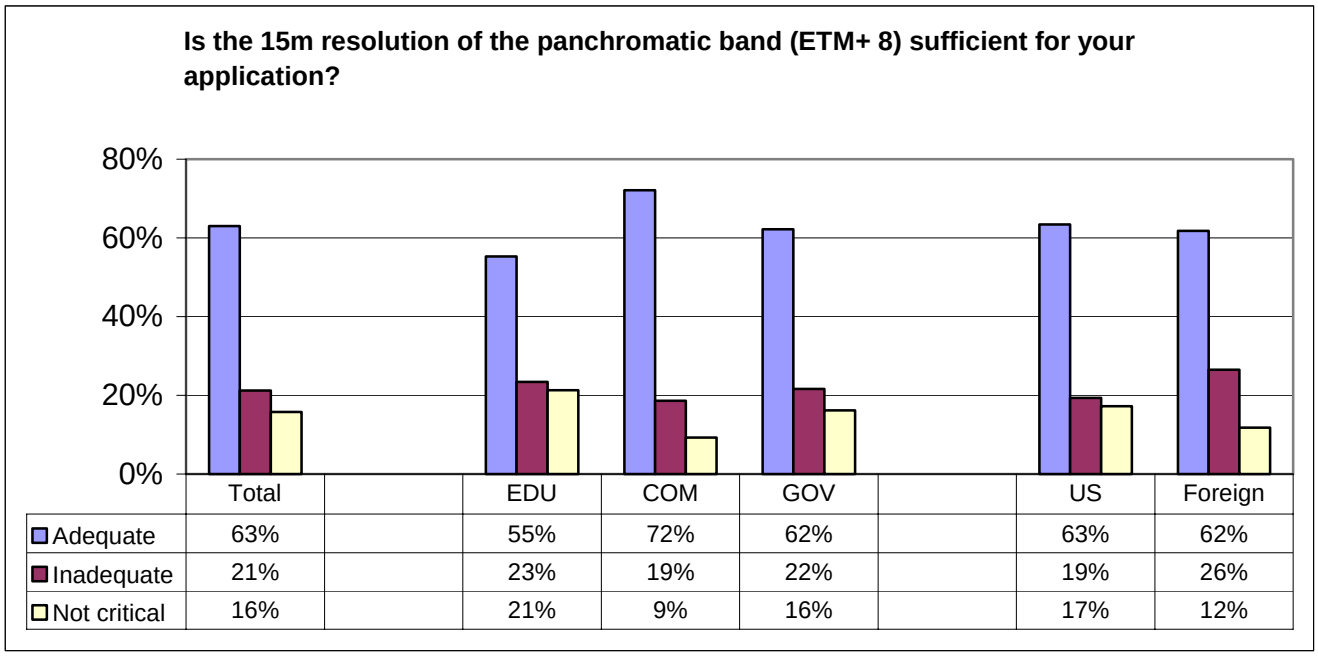
INADEQUATE	Origin
Go for 30 m	GOV
Need 30-meter data.	COM
Again for radiometric surface temp studies higher resolution would be helpful	COM
Clouds would be easier to delimit if this band also had 30 m resolution	GOV
ETM+6 is excellent for many applications but it would be much improved with higher resolution.	GOV
For mapping purposes it would be beneficial if the thermal bands were at the same resolution as the reflective bands. We use the thermal bands to help differentiate between water bodies and burned areas – our experience in 2000 with 28 ETM scenes was that the reduced relative spatial ‘resolution’ of the thermal bands reduced our mapping capability. U	EDU
Have not explored its use – partially because of 60m v 30m miss-matches with 6 other bands.	GOV
Higher resolution would be very useful	GOV
Higher spatial resolution thermal would be a great improvement, and facilitate its use with the other bands.	EDU

INADEQUATE	Origin
If economically feasible, would like to see at least 30 meter TIR and MWIR bands. Would prefer 15 meter resolution to aid in detailed fire and thermal pollution assessment.	COM
If this can be matched to the 30m resolution bands, it will be very useful	COM
See prior response.	COM
Should at least match the other narrow bands.	EDU
This scale is also not sufficient for detecting/identifying thermal inputs along the sea coast	COM

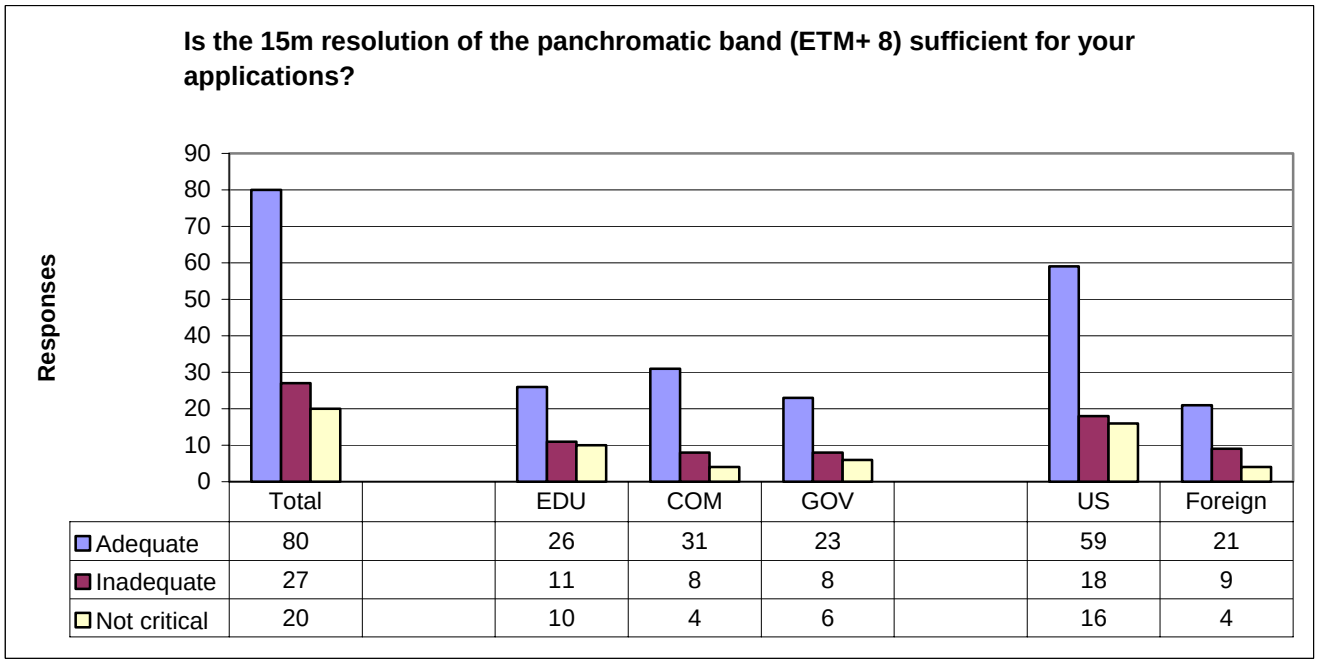
NOT AN ISSUE	Origin
Due to the current resolution - this has not been applied much. A resolution around 30m would fit better with e.g. farm buildings etc.	GOV
Thermal bands were not used in our product. We are however investigating their use for future applications.	GOV
Very few thermal applications	EDU
We don't use band 6	GOV
We don't use it. I sure would like to know some useful applications of those data.	GOV
Why to maintain band 6? Is really useful?	COM

Spatial resolution: continued

Is the 15m resolution of the panchromatic band (ETM+ 8) sufficient for your application?



	Total		EDU	COM	GOV		US	Foreign
Adequate	63%		55%	72%	62%		63%	62%
Inadequate	21%		23%	19%	22%		19%	26%
Not critical	16%		21%	9%	16%		17%	12%

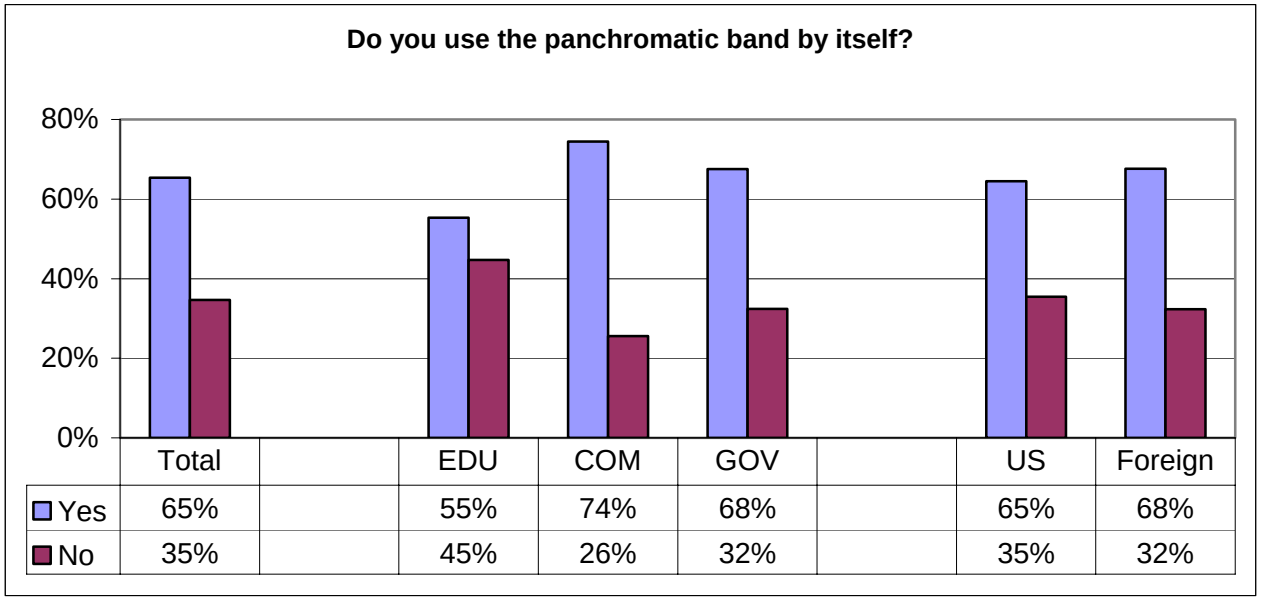


	Total		EDU	COM	GOV		US	Foreign
Adequate	80		26	31	23		59	21
Inadequate	27		11	8	8		18	9
Not critical	20		10	4	6		16	4

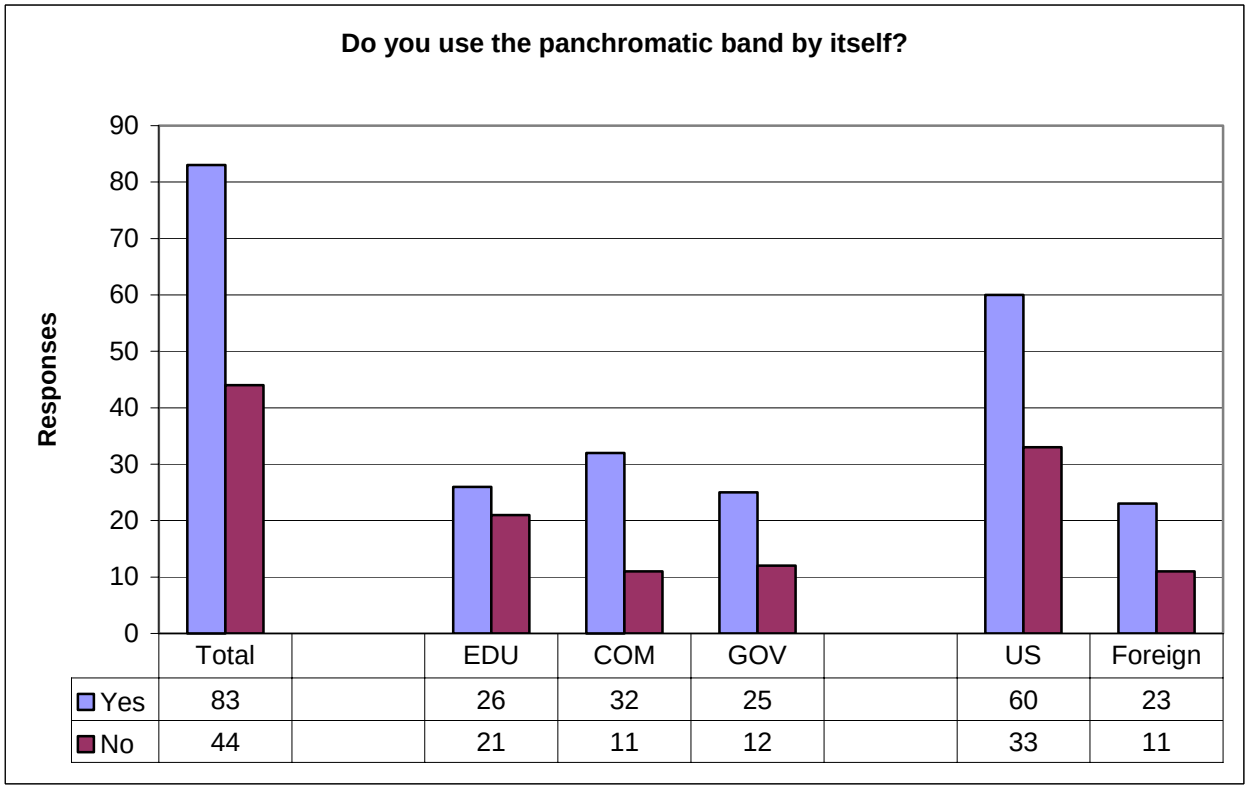
No Comments requested for this question.

Spatial resolution: continued

Do you use the panchromatic band by itself?



	Total		EDU	COM	GOV		US	Foreign
Yes	65%		55%	74%	68%		65%	68%
No	35%		45%	26%	32%		35%	32%

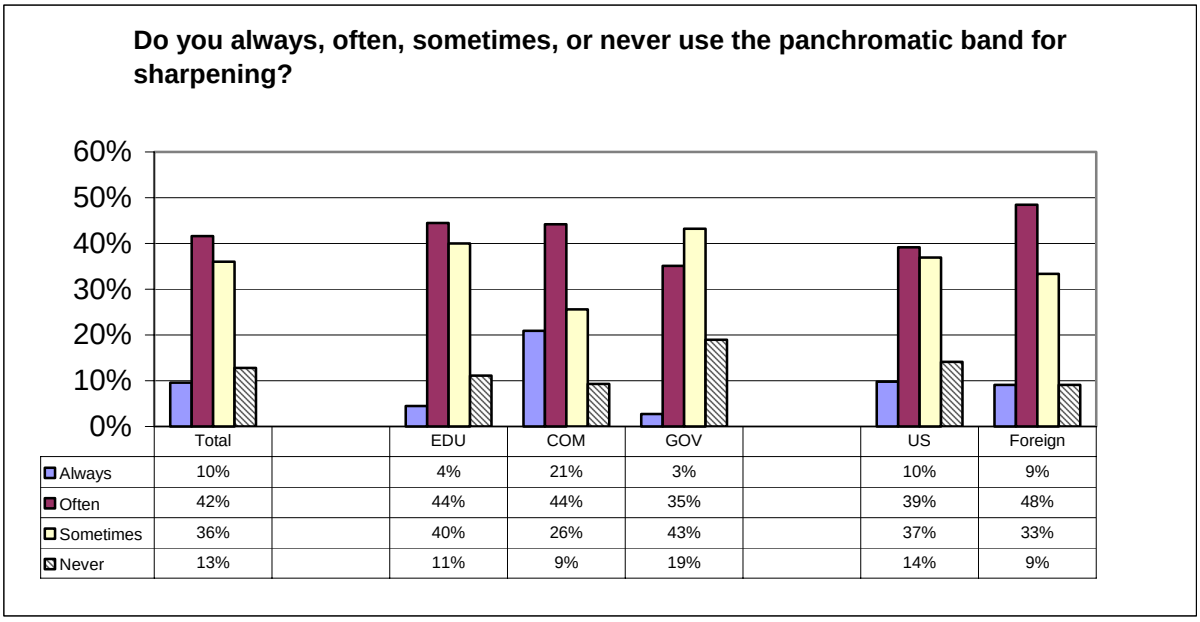


	Total		EDU	COM	GOV		US	Foreign
Yes	83		26	32	25		60	23
No	44		21	11	12		33	11

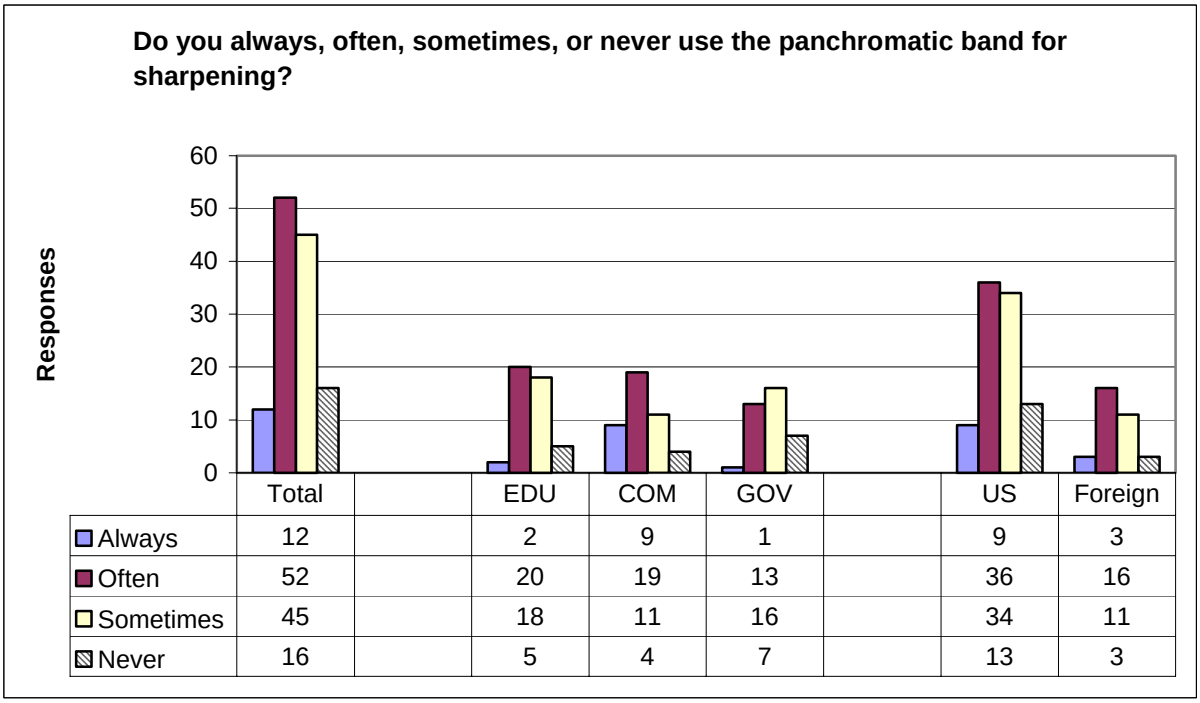
No Comments requested for this question.

Spatial resolution: continued

Do you always, often, sometimes, or never use the panchromatic band for sharpening?



	Total		EDU	COM	GOV		US	Foreign
Always	10%		4%	21%	3%		10%	9%
Often	42%		44%	44%	35%		39%	48%
Sometimes	36%		40%	26%	43%		37%	33%
Never	13%		11%	9%	19%		14%	9%



	Total		EDU	COM	GOV		US	Foreign
Always	12		2	9	1		9	3
Often	52		20	19	13		36	16
Sometimes	45		18	11	16		34	11
Never	16		5	4	7		13	3

Do you always, often, sometimes, or never use the panchromatic band for sharpening?

Comments:

ALWAYS	Orgin
A problem with the so-called panchromatic band is that it covers both a portion of the visible region AND a portion of the NIR. Green vegetation is dark in the visible and bright in the NIR. As a result, the contrast between vegetated areas and non-vegetated areas in ETM+8 is often poor or non-existent. Perhaps, there should be a pan band that is ... panchromatic (all visible colors -- excluding NIR). But, since old ETM+ data have the current VNIR configuration for Band 8, it is not likely that this change would be popular. There are techniques for subtracting the NIR part of Band 8 (using Band 4) to correct Band 8 to be a truer pan band, but this causes the resulting products to have degraded spatial resolution.	COM
I use Landsat datasets for looking at active geological faulting. Increased spatial resolution shows up more features of the faulting and in greater detail. It helps me a great deal	EDU
Its difficult to use the pan band alone because it spectral characteristics overlap to much in infrared spectral domain. So it can't have the look of a true visible panchromatic band.	COM
Often noisy signal Often suffers from systematic offset in columns as compared to 30 m bands, in scenes from CONAE - Argentina Station.	COM
Pan sharpening has become an increasingly important tool for research.	EDU
The 15 meter resolution has been extremely useful in imaging. It has removed the need to purchase a SPOT product for our purposes and in turn has lowered the cost enabling our clients to better afford imaging.	COM
The higher the pan-band resolution, the better.	COM

OFTEN	Origin
The panchromatic band is quite useful both by itself and as a device for sharpening the multi-spectral bands. Greater resolution is always a nice option, so even greater resolution (e.g., 5 or 10 meters) in a panchromatic sharpening band is useful.	COM
Very interested in having 3 VNIR bands at 15-meter because it will eliminate the sharpening processing.	COM
A Panchromatic Band 8 with a Spatial resolution of 5 m accuracy would enhance the Images we supply.	COM
Again, I would love higher resolution, but economical, synoptic coverage is more important.	COM
Also as a data fusion image	EDU
Combining it with XS improves the accuracy	GOV
Difficult, but not impossible, to fuse with multi-spectral and retain colour Characteristics of multi-spectral data. Example, natural colour using bands	COM

OFTEN	Origin
1,2,3 does not equal natural colour using bands 1,2,3 and 8.	
For some customer base maps we resample B's 2,3,4 to match the pan channel at 15 meter then do a brovey formula. It looks great!	COM
Good for visualizing small roads and rivers	COM
I use it mostly for its spatial resolution in visual analysis and sometimes band sharpening.	EDU
I use the panchromatic band for sharpening. A panchromatic band that was at an even better spatial resolution could remove the need for a secondary set of imagery (aerial photos). 5m resolution would greatly increase the utility and applications of the system.	EDU
Is resolution of Pan still 15m? I read some info that its degraded into 17m?	COM
It is useful for mapping land use and define the size of parcels.	EDU
Keep the bandwidth at the present level. The proposed Pan bandwidth of 500 - 700 nm will significantly reduce it's value. The present 500 - 900 nm range was chosen to provide the contrast needed for pan sharpening and image analysis. If the MSI bands 1-4 are provided at 15 m resolution, then the pan band could be eliminated.	COM
Resolution appears to be a little under 15m and often has a grainy appearance which limits the effectiveness of using it to sharpen the 30m data Would like to see a 5m pan band that would be an optimum to merge with 30m + dramatically increase applications. 5m pan would mean improvement of 30m colour not as important.	COM
See comment on bands.	GOV
Sometimes I use it by itself, especially for georeferencing airborne data and for high-resolution image backgrounds for overlaying GIS info. Otherwise I use it to sharpen the multispectral bands.	COM
The pan band is significant improvement for the Landsat program. Increasing the pan band to 5 or 10 m would drastically increase the range of applications however.	EDU
The same resolution of the spot pan band would be nice for a better comparison (in a change detection prozess)	EDU
The spectral width of the panchromatic band (the fact that it covers a wide range in the visible and NIR) seems to cause some problems. It makes certain features very difficult to see, and for resolution-merge purposes it is not very well suited. It would be better to take an approach like that of MODIS -- have two high resolution bands, one in the visible and one in the NIR.	EDU
We also use IRS or SPot pan for sharpening if 15 m resolution is not sufficient	COM
YES!! For geocoding purposes only (since we ordered Landsat HDF format, and had to geocode the scenes ourselves since ER Mapper incorrectly states it supports HDF format; when one imports the HDF format, the geocoding information is lost; it is not, therefore, what an end user calls a "supported format":). We used band 8 to get as much an accurate correlation between pixels of band 8 and ground control points from other images as possible.	EDU

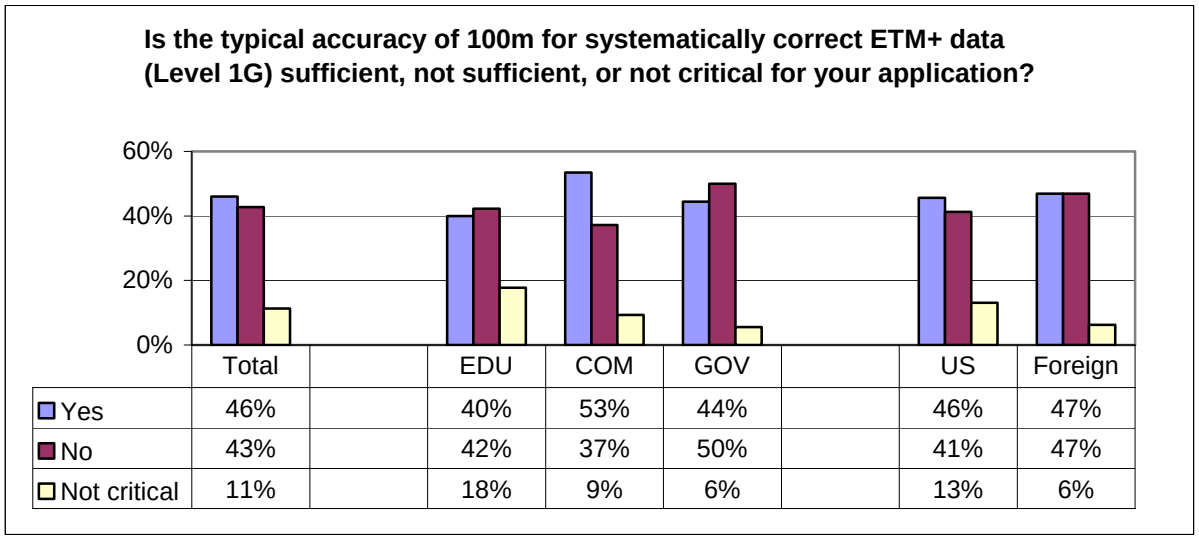
SOMETIMES	Origin
Adequate for many applications, but not all.	GOV
Again, better resolution may make this band more useful.	EDU
Haven't used pan-sharpened yet but are planning to if results warrant it (cost/benefit)	GOV
If the algorithms for sharpening ETM+ data were readily available, we'd use it more often; however, the cost to the end-user is one of storage space, as the added resolution creates imagery which doesn't readily fit on a CDROM.	GOV
Makes a good ground-control aid (spotting road intersections, etc.).	EDU
No comment	GOV
Only use sharpening to make pretty pictures - this is not science driven.	EDU
This band, with its current resolution is not very useful for my regional mapping project. A higher-resolution (with reduced coverage) might be more useful.	EDU
What naive questions! There are problems for EVERY spatial resolution. We should strive to solve any given problem with the coarsest spatial resolution that we can, so as to minimize cost and storage space and maximize area covered.	EDU

NEVER	Origin
Make the pan layer pixels (15m) nest inside the 30m pixels of the other layers…. then we’re talking!!!	EDU

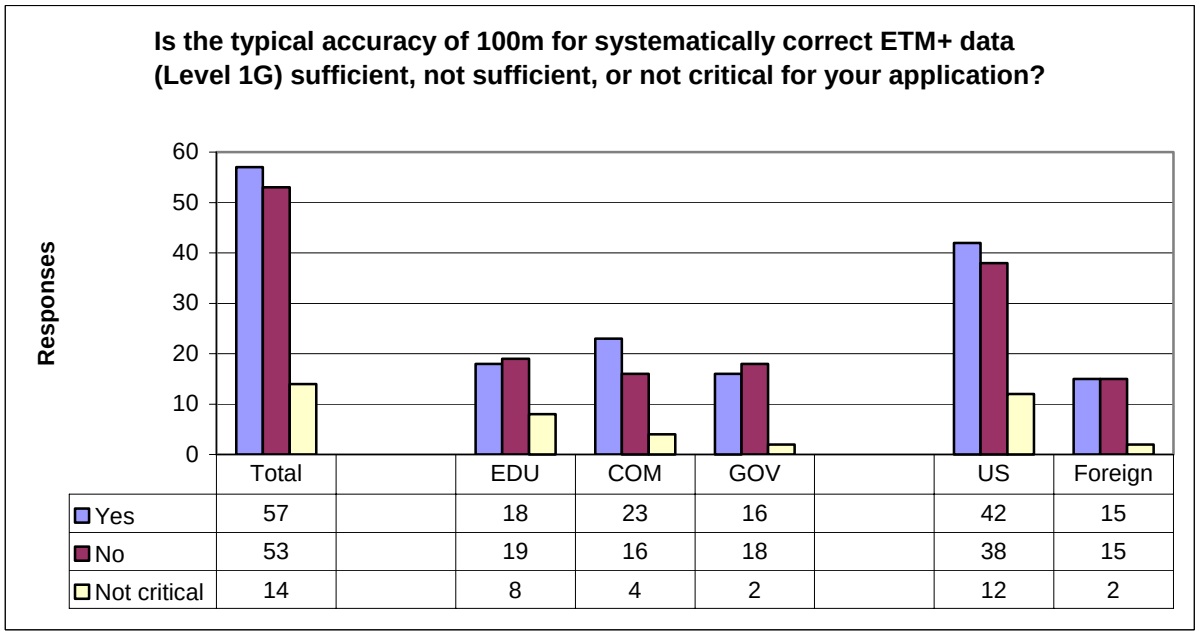
NO RESPONSE	Origin
Useful for better identification of small features.	EDU

Geodetic Accuracy:

Is the typical accuracy of 100m for systematically correct ETM+ data (Level 1G) sufficient, not sufficient, or not critical for your application?



	Total		EDU	COM	GOV		US	Foreign
Yes	46%		40%	53%	44%		46%	47%
No	43%		42%	37%	50%		41%	47%
Not critical	11%		18%	9%	6%		13%	6%



	Total		EDU	COM	GOV		US	Foreign
Yes	57		18	23	16		42	15
No	53		19	16	18		38	15
Not critical	14		8	4	2		12	2

Is the typical accuracy of 100m for systematically correct ETM+ data (Level 1G) sufficient, not sufficient, or not critical for your application?

Comments

SUFFICIENT	Origin
<30 m accuracy is typically what I need.	GOV
100 meters is good enough but more accuracy would not hurt.	COM
Change detection and environmental monitoring require accurate delineation of landforms and change areas. So, 100 m geodetic accuracy is low and not desired for such kind of studies.	GOV
For about half the applications this level of precision is adequate.	COM
For most applications, 100 m is adequate but better accuracy is welcomed.	GOV
I perform my own higher-level terrain corrections.	EDU
I use PCI OrthoEngine for precision registration but the positional error I have observed is more in the order of 20-m to 30-m. You guys are actually achieving better than Space Imaging Carterra Geo 1-meter Pan product accuracy!	GOV
I usually improve this through the use of ground control points (from higher resolution sources) followed by warping the data to better fit the map projected (i.e., DEM corrected or other methods of re-sampling).	COM
If it can be improved, very good !	COM
It is for some, but not for others. By and large, I find my own control points usually to do the final corrections, so 100 m is good enough. It used to be 1.5 km, and that was bad.	EDU
This is OK for single images. We need to improve rectification when we match these images to others.	EDU
under 50m preferred	COM
Usually better that the mapping for the areas I am interested in Africa etc	COM
Usually, but I wish it were better.	EDU
We do a lot of scene mosaics, so geometric correction to sub-pixel level (especially in adjacent scene overlap areas) would be great, but only if cost can be maintained at current level.	COM
we generally apply map correction	COM
It would be nice to have <100m accuracy - particularly since if we have to re-register the data it will degrade it.	EDU
We are not ready to provide a good answer to this question	EDU

NOT SUFFICIENT	Origin
The 100 meter accuracy is adequate for some regional work. Much work, however, requires the images to be used either with other images that are accurately registered, or in with GIS systems that will be using the images in conjunction with other cartographic data sets. More accuracy is required for quantitative work.	COM
~30 meter accuracy is essential for the use of Landsat imagery. Image to image comparisons and vector analysis is required for all of our imagery use. A single unregistered image is of little value to operational users.	GOV

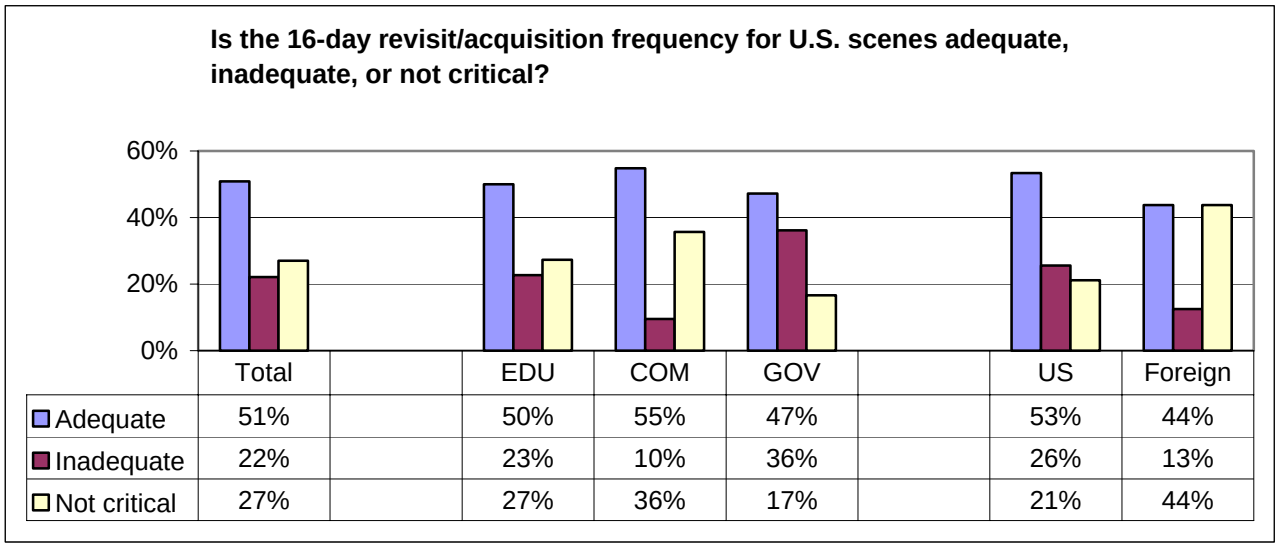
NOT SUFFICIENT	Origin
Geometric registration for all scenes with DEM corrections should be provided for all scenes.	GOV
100 m might be sufficient for uninhabited areas in developing countries, but not for industrialized areas like Europe or so...	EDU
100m sucks. Temporal analysis has been demonstrated as limited with as little as 1/2 pixel shift	EDU
30m accuracy would be much more useful for me	EDU
A suggestion: If the accuracy is not good enough, why don't you have a product with all the calibrations and corrections but without any registration? something in between level 1R and 1G	EDU
Again it's better than Landsat 5, but we need better accuracy for our applications, so we geocorrect ourselves.	EDU
All data should be delivered ortho corrected to a user-specified projection/datum with 0.5-1.0 pixel max RMS.	GOV
Although the object was aligned with the L7 path the image was still not aligned. It was aligned with ALI.	XXX
Definitely need greater accuracy in this area!	EDU
Especially for regions in the 3. world, where you don't have accurate maps	EDU
For Ag. classification 100m is not very good when field edges need to be refined to about 10-20 feet.	EDU
For our purposes, and more generally for change detection, it would be desirable to improve the ETM L1G 100m (3 sigma ?) accuracy to 60m (3 sigma) - this would ensure a relative error of less then +/-2 30m ETM pixels. (The ETM accuracy seems to be better than the spec.) Ã¼	EDI
GPS does better these days, uncorrected. We should expect 10 m or less accuracy.	EDU
Have to supplement with additional correction/assessment	GOV
I mainly use orthocorrected images, so this question is not relevant. 100 m Level 1 G data would not suit most of my needs. It would be best if future satellites had star-trackers or other accurate navigation gear, so that accuracy to 50 metres was available without GCPs. Then orthoimages could be provided without operator intervention, and the cost would be much the same as 1R and 1G.	COM
I would urge an accuracy of one pixel to allow painless mosaicing of images.	GOV
Ideally an orthocorrected product is preferred.	COM
It would be better if these data were more accurate. We purchase data for the Amazon Basin and Russia, both areas of poor mapping and poor ground control. Improved accuracy in ETM data would be a positive step in the right direction.	GOV
It would help if the accuracy was half of a pixel or better. If not, 100 m is adequate.	GOV
No - in order to use the data we will always geo-correct ourselves to 20 m. accuracy	GOV
Not at all, 100m is very inaccurate for the scale we are working on. It would be nice to reduce it to the pixel size of the band involved, so say: 15m for band 8. With this 100m accuracy, I would even consider re-registering the image myself, to reduce the error by using good ground control points. (Which is what we did in the case of the HDF formatted scenes).	EDU

NOT SUFFICIENT	Origin
Should be down to approx. 2 pixels (60 meters). I have experience with some scenes that reach this accuracy. We checked the overall accuracy using GPS.	COM
This is more a qualified No - 100m geodetic accuracy is ok for many things, but not for others	GOV
To be honest, this was a disappointing. It really make things difficult when working with time-series of scenes.	GOV
Typically we aim for +/- 1 pixel for the 30m data	COM
Typically we have to geocode the data separately.	EDU
We always end up redoing the geocorrection or things won't align with the GIS database.	EDU
We are intending to orthocorrect our TM 7 data.	GOV
We have to bring it down to +/- 0.5 pixel for our change detection efforts.	GOV
We NEED to have the images georectified to within less than one pixel (ie, less than 30 m). This means that we have to resample every scene ourselves anyway. I would prefer NOT to have USGS perform any other re-sampling that can be avoided. The more times that a scene is re-sampled, the more the pixel values are degraded.	EDU
We need to rectify to 15m or better	GOV
We use additional control points to improve geodetic accuracy.	GOV
We would like higher accuracy.	GOV
With the GPS Selective Availability (SA) switched off, a greater scene accuracy would be useful. Improvements have been seen since the middle of last year.	COM

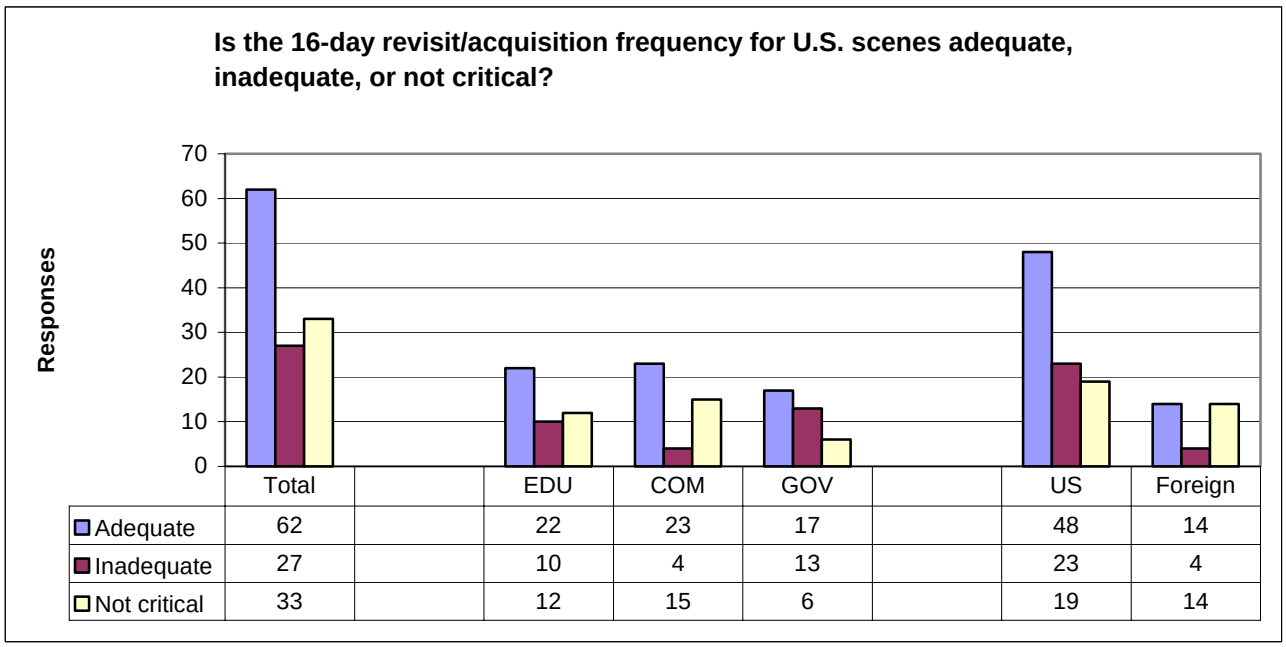
NOT CRITICAL	Origin
I’ve been having my scenes georeferenced and terrain corrected by a third party vendor.	GOV
This really isn’t an issue, as we always rectify the imagery to base maps or GPS data before using it in our applications.	EDU
We usually end up geocoding the data w/ our own GCPs so the 100m accuracy is not critical.	EDU

Repetition Rates:

Is the 16-day revisit/acquisition frequency for U.S. scenes adequate, inadequate, or not critical?



	Total		EDU	COM	GOV		US	Foreign
Adequate	51%		50%	55%	47%		53%	44%
Inadequate	22%		23%	10%	36%		26%	13%
Not critical	27%		27%	36%	17%		21%	44%



	Total		EDU	COM	GOV		US	Foreign
Adequate	62		22	23	17		48	14
Inadequate	27		10	4	13		23	4
Not critical	33		12	15	6		19	14

Is the 16-day revisit/acquisition frequency for U.S. scenes adequate, inadequate, or not critical?

Comments:

ADEQUATE	Origin
Increasing the revisit frequency would greatly increase the utility of Landsat data for all my applications. I would hesitate, however, to trade off pixel size for revisit frequency.	GOV
A 5 to 10-day revisit/acquisition could be better	GOV
Adequate although cloud cover reduces the no. of useful scenes. The 16-day cycle is tied to the formation orbit with EOS-TERRA and this should not be broken. Would suggest that have 2 Landsat ETM sensors in formation with TERRA and AQUA to give an effective 8-day revisit cycle.	EDU
Again, a higher revisit rate would be better.	GOV
As with the spatial resolution, the temporal resolution is adequate but higher resolution would always be welcome. Since a large part of our work is in the Amazon rainforest, it is often difficult to find cloud-free images. A higher temporal resolution would give us a greater chance to acquire cloud-free imagery.	EDU
But for our efforts in cloudy areas more would definitely be better.	GOV
But increased temporal res. would be good.	EDU
Date retrieval in Greenland in inadequate for our usage.	EDU
For agricultural/forestry research, it would be good to have a constellation of two or more Landsat satellites in tandem orbit, with local overpass times of mid-morning (as is currently done) and mid-afternoon (1500 hrs local time). For operational agricultural applications, it would be good to have an even denser constellation to provide such morning & afternoon coverage on a daily basis. At any rate, it would be preferable to increase the repetition rate by having more satellites than by making the image resolution any coarser	EDU
In polar regions, the actual revisit is assisted by the convergence of orbits.	GOV
It will be better if L5 data would be available from USGS also.	COM
The only way to improve this would be to have 2 or more ETM+ in operation or to widen the swath. The latter will not work well due to the effects of BRDF for wide-angle swaths.	COM
The repetition rate is adequate but sometimes cloud coverage can effect the usefulness of a 16 day cycle. A shorter cycle could be beneficial.	EDU
This is adequate although quicker revisit would be very useful for study in cloudy areas and during the wet season. This would make Landsat much more useful for studies of crop growth during the growing season.	EDU
We could have used daily (or more often, to address cloud coverage) data on any of the scenes we bought for ongoing news coverage.	COM
We need at least 4 ETM's up there for every 4-day coverage agricultural and environmental monitoring, as well as disaster monitoring. That is where the commercialization of LANDSAT should come from.	EDU
With another ETM+ instrument taking the place of Landsat 5, we could get ETM+ images every 8 days. That is more than enough!	COM

INADEQUATE	Origin
10 days or under	GOV

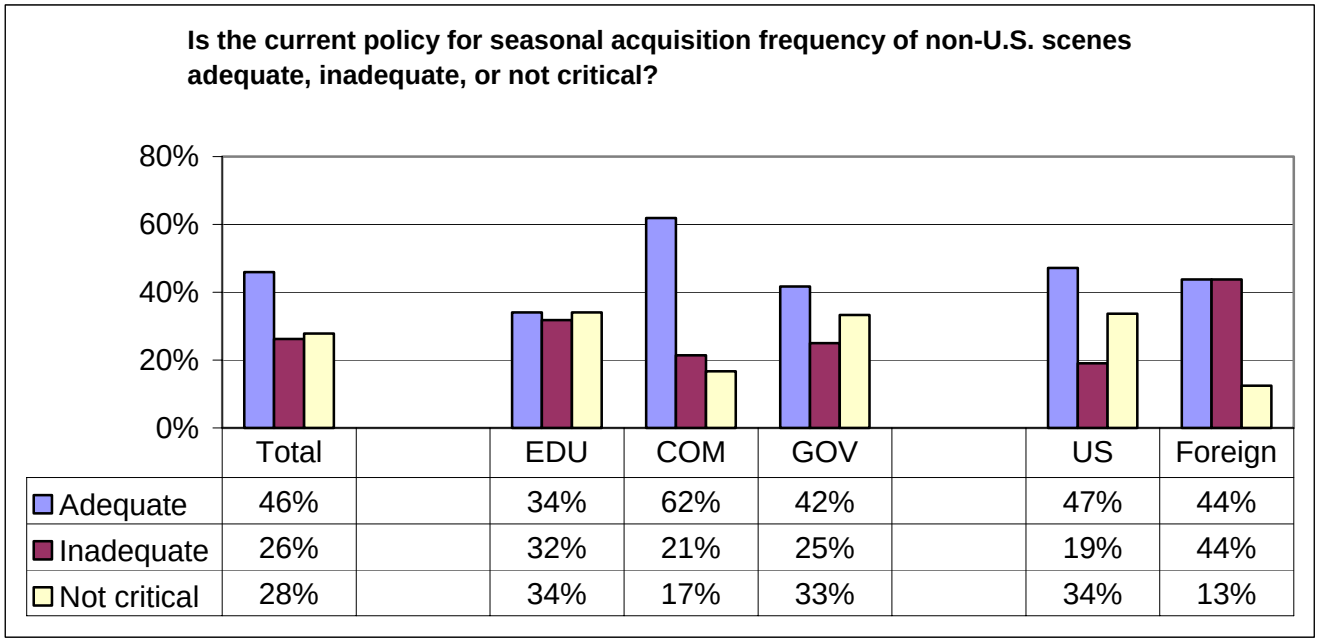
INADEQUATE	Origin
The 16-day revisit at times doesn't allow for enough cloud free days in needed months for a multi-temporal seasonal use.	EDU
At a minimum, we would like a 7-day revisit frequency.	GOV
Cloud cover precludes obtaining statewide imagery in every targeted season.	GOV
Crop stages are important therefore a more frequent visit would help, particularly if cloud cover means waiting for the next flyover which would mean another 16 day wait. We filled in with Landsat 5 images.	GOV
Even in arid regions, it is hard to obtain cloud-free scenes.	GOV
Higher frequency would improve the chances of cloud-free scenes.	GOV
I am working in Alaska and often have problems finding cloud-free imagery. I would hope/expect that more frequent return intervals would increase my chance of finding the imagery I need.	GOV
In regions where you have much cloudy days, a better temporal resolution would be nice	EDU
It would be nice to have more data during fire season.	GOV
More frequent revisits would be helpful for studies characterizing radiometric surface temps	COM
One week revisit would be desirable – looking at desert ephemeral plants, growth patterns are non-cyclical and quick	GOV
Oops, don't use US scenes but can't undo the button... but we don't get enough clear overpasses in a year and can only improve on that by more frequent overpasses (or better weather..)	EDU
Since we are identifying crop type and measuring crop acreage during a crop season, we need 8 day or better TEMPORAL COVERAGE. The temporal windows for crop discrimination are very narrow and are usually 30-45 days long during peak vegetation. The ideal system for us is 2 or more Landsat like satellites giving 8 day or better temporal coverage. Landsat 5&7 and then Landsat 7&8.	GOV
The 16-day revisit frequency is probably minimum adequate for most areas, but there are several path/row locations for which there are no cloud-free scenes in the Landsat 7 database. For our applications, cloud-free data is MUCH more valuable than partially cloudy.	COM
The revisit schedule is disappointing because of the short solar incidence window and incipient cloud cover in our Northern Latitudes (Alaska).	GOV
This is the area where the greatest improvements could be made. The 16 day repeat limits Landsat to seasonal & inter-annual realizations (except in cloud free areas). Multiple ETM+ sensors in synchronized orbits allowing for 2-4 day repeats would vastly increase the potential applications of Landsat class observations. Point able optics are not a viable solution. The problems introduced by different viewing geometries, atmospheric paths and BRDFs more than offset any apparent gain in revisit frequency.	EDU
USDA averages 60% acquisitions with cloud-cover of less than 50%. This means in many areas a single Landsat satellite receives adequate observations once a month, if we are lucky. Monitoring crops requires at less a 7-8 day observation to ensure the growing season is adequately covered. With the current observations (excluding L5) it is very, very difficult to monitor within-season crop progress (multi-temporal analysis is the only way to analysis crops) or compare between seasons at the same crop stage	GOV
We find it difficult to find cloud-free coverage for our regional studies. Sometimes we only	EDU

INADEQUATE	Origin
need 1 cloud-free scene during the peak growing season.	
We have a real problem obtaining good images because of cloud cover. It would be helpful to increase the revisit frequency, IF this were done right. Having multiple satellites would be great. Having a single point able satellite would NOT be much improvement, because for my application I do not want to use off-nadir imagery (due to geometric and atmospheric considerations).	EDU
We need something much better for oceanographic and disaster monitoring applications: once per day. However, I realize that this is impossible to expect, but perhaps having two satellites 24 hours apart would get us most of what we need, especially if they were point able.	COM
We often miss critical events (fires, etc). need more birds for greater repeat intervals	EDU
We would love to have a lot more data, also at different times of day if possible.	EDU
With more than 50% of the US scenes made unusable by cloud cover, you are lucky to get one good scene of a given area a month. Many Applications and in particular agriculture, monthly acquisition is barely useful. Weekly would be best.	COM

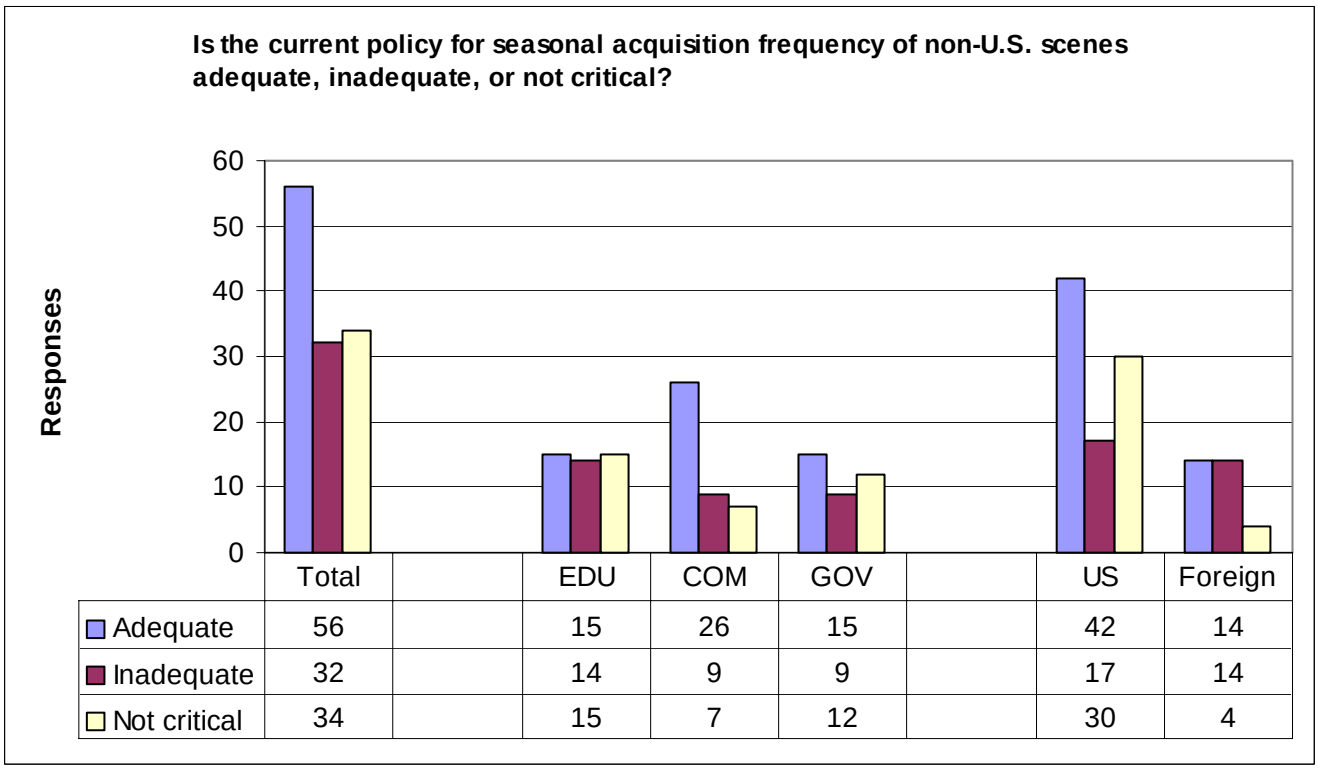
NOT CRITICAL	Origin
All work is external to US Prime sites are in Antarctica and Southern Ocean islands	GOV
But in my area, two satellites would be an advantage, if they both had L7 prices and license conditions. Tasmania, Australia is a moderately cloudy region, and images are often not available when required due to cloud. An 8-day revisit frequency would greatly improve this. For natural disaster management, two satellites would be more likely to get images without programming SPOT.	COM
Don't do work here	EDU
Not a user of this type of imagery	COM
Not used	COM
Not working on US scenes. Undoubtfully a good thing to have scenes every 16 days.	GOV
Weather is the critical aspect not how often. Cloud cover is the biggest issue.	XXX

Repetition Rates: continued

Is the current policy for seasonal acquisition frequency of non-U.S. scenes adequate, inadequate, or not critical?



	Total		EDU	COM	GOV		US	Foreign
Adequate	46%		34%	62%	42%		47%	44%
Inadequate	26%		32%	21%	25%		19%	44%
Not critical	28%		34%	17%	33%		34%	13%



	Total		EDU	COM	GOV		US	Foreign
Adequate	56		15	26	15		42	14
Inadequate	32		14	9	9		17	14
Not critical	34		15	7	12		30	4

Is the current policy for seasonal acquisition frequency of non-U.S. scenes adequate, inadequate, or not critical?

Comments:

ADEQUATE	Origin
USDA needs more frequent coverage. Ask USDA/FAS what there needs are for non-U.S. coverage.	GOV
Well, review of L7 archive reveals acquiring only up to 5-10 scenes per year for non-US scenes (or at least for my study area). This is an inadequate and limit acquisition capabilities of Landsat and constrain the use of its data for monitoring and change detection studies which prerequisite anniversary scenes.	GOV
Adequate	EDU
Adequate except for cloudy regions, like the equatorial rain forests.	EDU
Adequate, yet could be improved to acquire data for 'hot spot' areas and locations with limited Landsat 4/5 acquisitions.	GOV
For some of the non-US scene we have had to put in a special request for the scene to be collected (overriding the seasonality acquisition plan). This has worked fine and such provision to serve NASA science should be considered for the follow-on mission.	XXX
It is adequate but EDC should allow some flexibility for special orders. If a user wants to target a particular agriculture area in a part of the world not covered by a ground station, they have to make do with at best quarterly updates. This frequency is not adequate for agriculture.	COM
Please note that in practice this frequency is not true, as very often data acquisition is interrupted for several weeks at a time.	EDU
Suggest special increased effort [beyond the seasonal] should be made to acquire a cloud-free scene for scene areas not yet covered by a cloud-free image [and I mean cloud-free, not just a few percent coverage]	EDU
The highest the frequency of acquisition, the best it is... We cannot complain as in South America we have 2 local stations, in Brazil and CONAE, which acquire nearly all the data acquired by the satellite.	COM
The International Ground Stations seem to have reasonable archival of non-US scenes, though their search-and-order procedures are not yet quite as smooth as EDC's, and of course proprietary restrictions by some of them are a distinct impediment.	EDU
We don't work much with non-U.S. scenes.	COM

INADEQUATE	Origin
We have many difficulties in trying to obtain digital images of foreign project areas. We are at the mercy of INPE, in one location, who seem not to understand the nuances of the data preparation and formatting that we rely on here. We need as many foreign scenes as possible to be available in the U.S., until foreign vendors learn the techniques of data supply.	COM

INADEQUATE	Origin
Agriculture monitoring of international areas is just as critical or MORE critical than domestic monitoring. Currently, (outside NTM)foreign governments and companies can provide and monitor agriculture of the US better than the US can monitor international crops. USDA is currently relying on a French Govt. subsidized to provide my low resolution information (1KM) because the US Govt. sensors are so unreliable and inaccurate.	GOV
Areas outside the US are important as well, several research projects, even with US scientist are carried out and they rely on all year round data. Especially in the tropics or semi-arid regions where significant seasons take place, it is necessary to have continuous data acquisitions.	EDU
Difficult to obtain cloud free scenes in areas what are hampered with cloud cover during seasonal changes, like South America.	COM
Especially in tropical or humid areas where in some cases no fairly cloud free scene can be acquired within one or two years. Which makes regular change detection a gamble.	COM
generally seasonal scenes has cloud where EDC archive or service giving 0% cloud in the internet browsing system. EDC should have more cloud free scenes	COM
Having trouble getting international winter images	COM
I had problems in the tropical areas where cloud coverage is usually high, so I had to few to choose from. Those areas are really important for global studies so should be acquired more often.	EDU
I work with summer High Arctic imagery, in which cloud cover is a problem. Routine collection and archiving of data from high latitudes would be very useful to me as with a 16 day repeat cycle cloud-free Arctic imagery is a rare commodity.	EDU
I'm from Canada.... US owned and operated Landsat may be, but my country is bigger than yours (sorry)... I'd like to do the analysis you can do with your data volumes.... you'll love to hunt and fish up here, I want to make sure you still can!!!	EDU
I'm not entirely sure what the current policy is, but for 203/23 we're still waiting for a clear scene - it's not really that cloudy in the UK! The one day that would have been perfect, data was not collected due to engineering.	EDU
In spring/summer/autumn period all scenes should be acquired in order to get a good success rate for cloud-free scenes.	GOV
Insufficient frequency in areas that generally have clouds. This makes it difficult to find a good image of a rainforest region.	EDU
It is a severe problem that some scenes received by local stations are not catalogued in the US-archive	EDU
Most of our work is done overseas so we would like to see an increase in the frequency of acquisition of non-US imagery.	GOV
Need to have 16 d acquisition frequency for all non US scenes	EDU

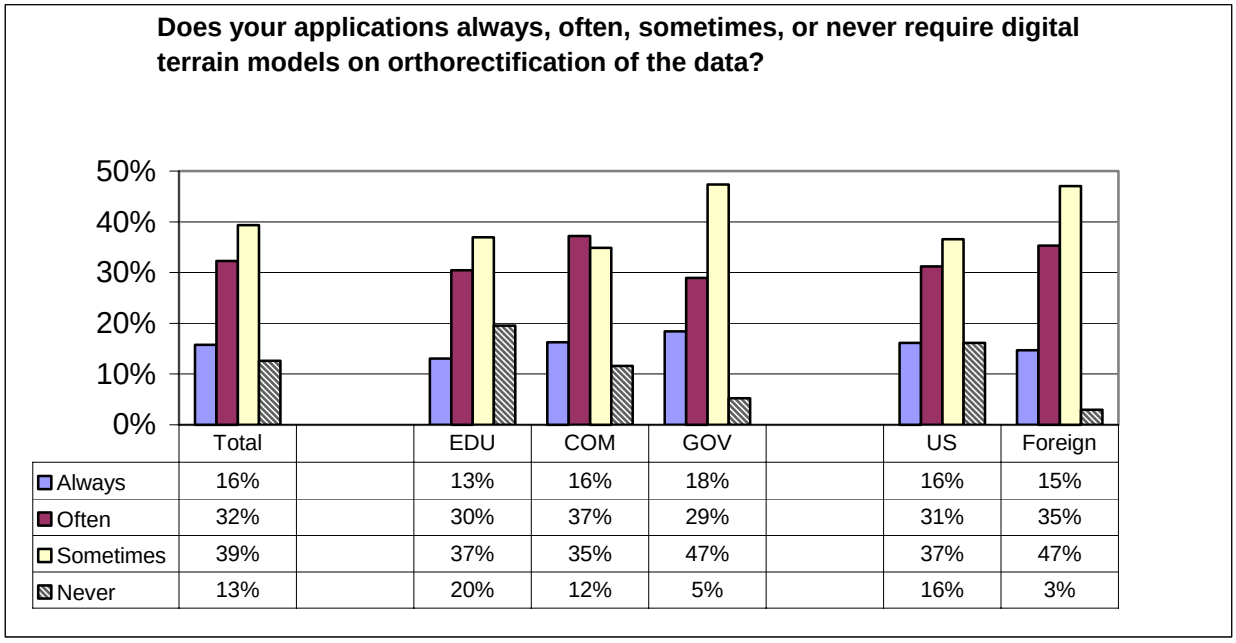
INADEQUATE	Origin
Not adequate for many applications (i.e., change detection in biologically complex ecosystems).	GOV
See previous comment	EDU
Sub-Antarctic islands: Acquisition needs to be as frequent as possible (every orbit on specified path irrespective of season) in order to overcome problem of high frequency of cloud cover and low opportunity to acquire cloud free images of even parts of some islands, for instance Heard Island. Antarctica: Require complete repeat coverage, at least of coastal margins and all glacier systems, each year and require images early and late in austral summer season."	GOV
The strategy is good given the constraints of a global acquisition strategy. However it fails to consider certain non-US applications that are not concerned with a capturing a representative temporal sample of annual phenology. These applications include aid and disaster management applications and studies that require several scenes within defined 1-2 month periods. An improved procedure to vet and get acquisition requests into the system is required.	EDU
We would have appreciated more scenes, especially in Southern Europe where it's not too difficult to have clear sky conditions. We hope it is due to the youth of the sensor and that the situation will improve.	GOV
Year-round acquisition is critical for international areas which have high cloud cover much of the year. By collecting data at each overpass, the likelihood of cloud-free data being available for those regions increases dramatically.	EDU

NOT CRITICAL	Origin
At the moment, it is not important. However, we will likely be interested in looking at scenes over Papua New Guinea sometime, since our work is funded by the DOE ARM (Atmospheric Radiation Measurement) program and they have sites in that area.	EDU
Don't know what the policy is	GOV
I source data from ACRES, Australia, who acquire all Australian images.	COM

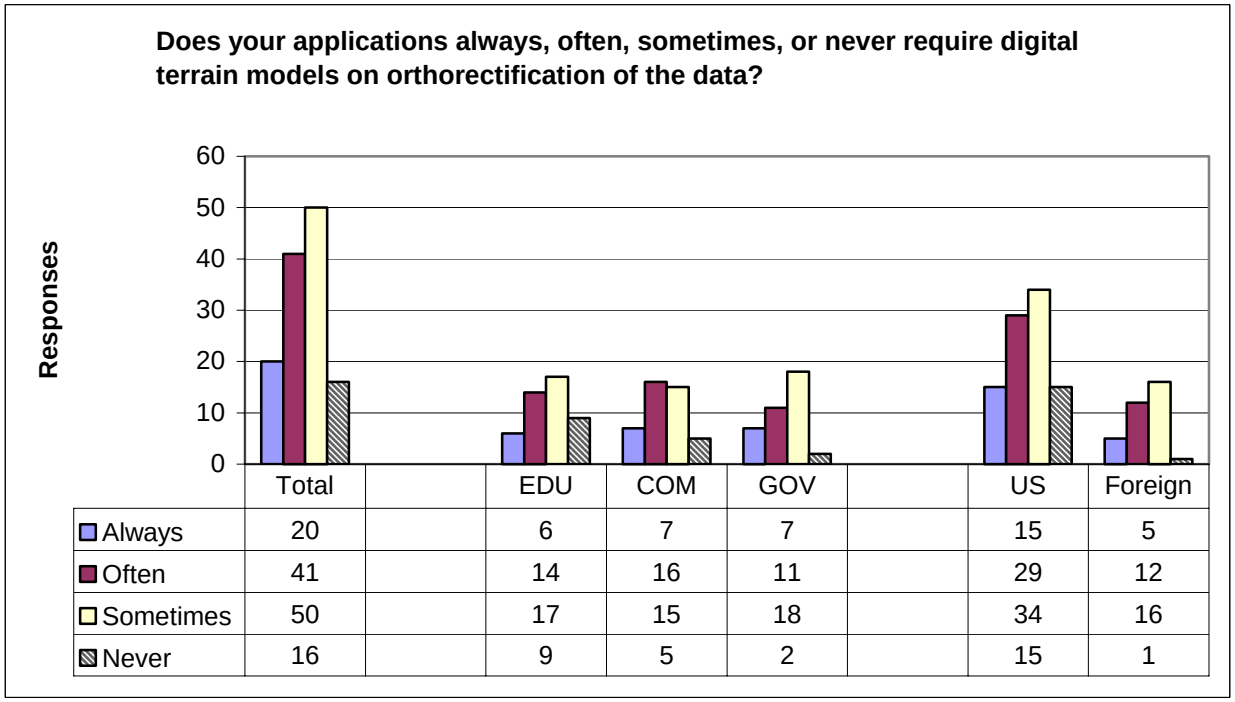
NO RESPONSE	Origin
Data should be collected as frequent as possible.	COM
Don't know what this means.	EDU
I am not familiar with the policy, but for populated areas more frequent revisits are always better, again for obtaining cloud free imagery.	COM

Data Correction Practices:

Does your applications always, often, sometimes, or never require digital terrain models on orthorectification of the data?



	Total		EDU	COM	GOV		US	Foreign
Always	16%		13%	16%	18%		16%	15%
Often	32%		30%	37%	29%		31%	35%
Sometimes	39%		37%	35%	47%		37%	47%
Never	13%		20%	12%	5%		16%	3%

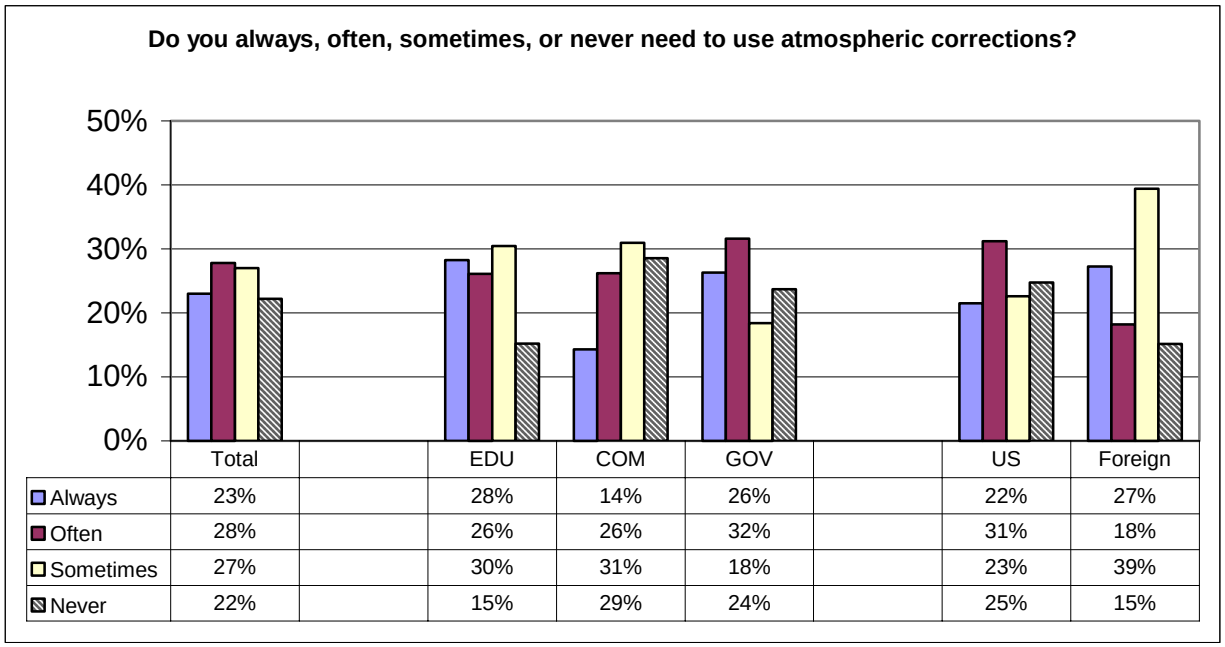


	Total		EDU	COM	GOV		US	Foreign
Always	20		6	7	7		15	5
Often	41		14	16	11		29	12
Sometimes	50		17	15	18		34	16
Never	16		9	5	2		15	1

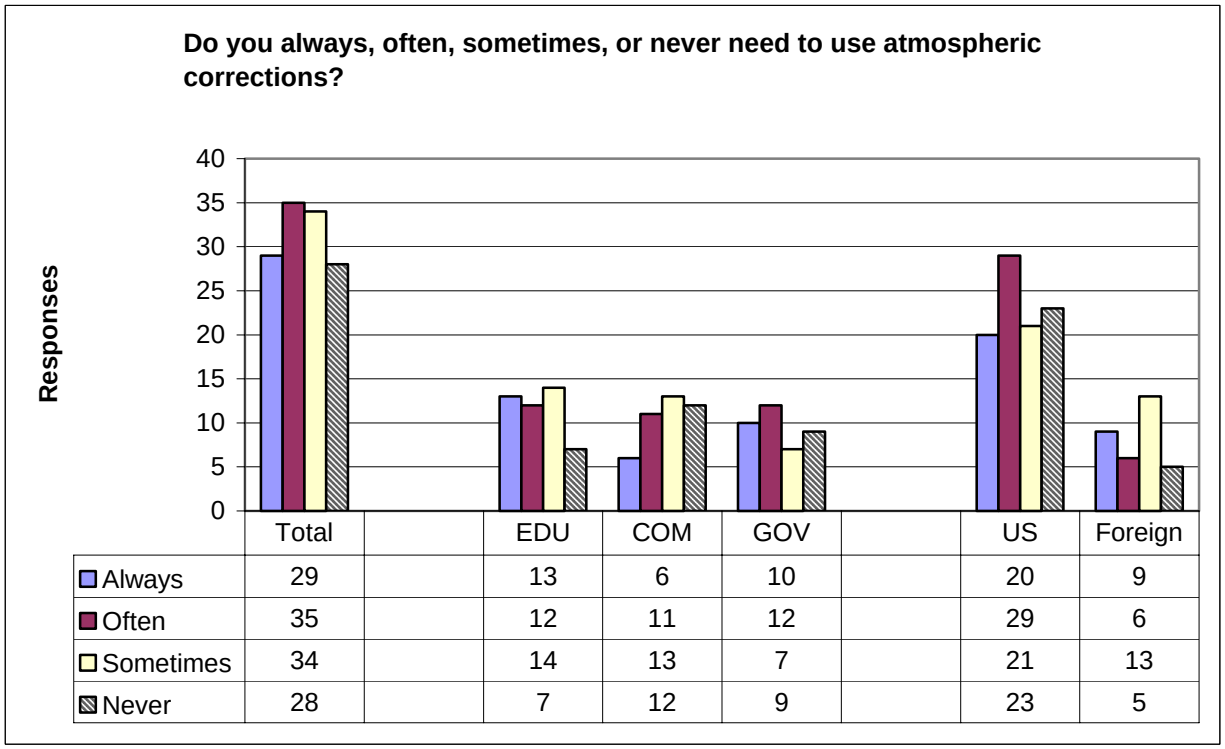
No Comments requested for this question.

Data Correction Practices: continued

Do you always, often, sometimes, or never need to use atmospheric corrections?



	Total		EDU	COM	GOV		US	Foreign
Always	23%		28%	14%	26%		22%	27%
Often	28%		26%	26%	32%		31%	18%
Sometimes	27%		30%	31%	18%		23%	39%
Never	22%		15%	29%	24%		25%	15%



	Total		EDU	COM	GOV		US	Foreign
Always	29		13	6	10		20	9
Often	35		12	11	12		29	6
Sometimes	34		14	13	7		21	13
Never	28		7	12	9		23	5

Do you always, often, sometimes, or never need to use atmospheric corrections?

Comments:

ALWAYS	Origin
As stated above image-to-image comparisons require radiometric quality, which means atmospheric calibration.	GOV
At the very least, a haze removal/dark target subtraction is applied before any multi-spectral analysis.	GOV
Most often a black-body subtraction is adequate for our tasks.	EDU
Necessary to compare NDVI over a time series but tough to do effectively.. Also on the lake work, it is essential because the lake signal is so very small from our dark lakes. We have tried to monitor lake recovery from acidification but the change in the lake signal is right at the level of noise from the atmosphere...	EDU
Temporal analysis is NB..... Atmospheric correction removes one of my unknowns...	EDU
The within-scene variability of atmospheric optical density is a major problem for us. We are VERY interested in the Atmospheric correction sensor on EO-1. It would be a MAJOR improvement if there was one onboard Landsat-8.	EDU
These are critical for change detection.	GOV
This is necessary for any comparison of conditions over time	EDU
We generally do black body corrections.	GOV

OFTEN	Origin
Will be interested if reflectance (calibrated) data product is available.	COM
Atmospheric correction is of interest primarily for the LWIR band (6).	EDU
I would make MUCH more use of atmospheric correction techniques if there were a reliable way of doing so. For quantitative analysis (not just visual interpretation), atmospheric correction is really critical.	EDU
Only need terrain corrections in locations with high relief.	GOV
DAAC atmospheric corrections based only on climatologic are not very useful for many applications such as quantitative change detection. Users require contemporaneous atmospheric data (e.g. aerosols) that characterizes the atmosphere if they wish to undertake their own robust corrections and these should be provided with any DAAC atmospherically corrected product if possible.	EDU
It would be brilliant, if your data would be atmospheric corrected and if needed terrain corrected - but with method specifications (SRT-1 could be a solution?)	EDU
We often pay private corporations to ortho process the data	GOV
We prefer to apply our own terrain corrections in order to use best available DEM information, which we generate as part of our programs.	EDU

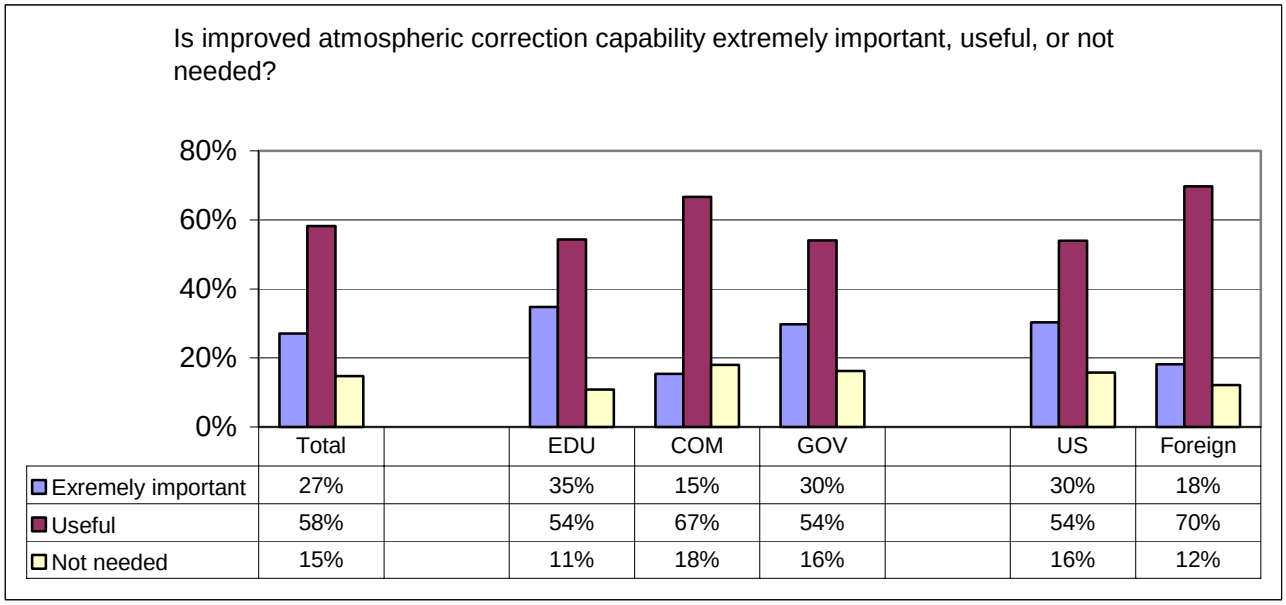
NEVER	Origin
For accurate DEMs of non_US scenes, a high resolution and very accurate image rectification is needed, otherwise I will not even attempt it as results are too unreliable.	EDU

NEVER	Origin
I want to do these myself because I need the correction information for other things (atmospheric modeling). I would not trust an unknown govt. or industrial employee To do this for me. Big organizations think they know more than they actually do know about technology.	GOV
Might use for haze if algorithms were easy to run with little overhead and had substantial information gain. So far, we haven't used any.	GOV
There are too many ways to achieve atmospheric correction. The end user or geospatial middle tier should do this ... not the government.	COM
We would appreciate indications on signal degradation due to e.g. large aerosol content.	GOV

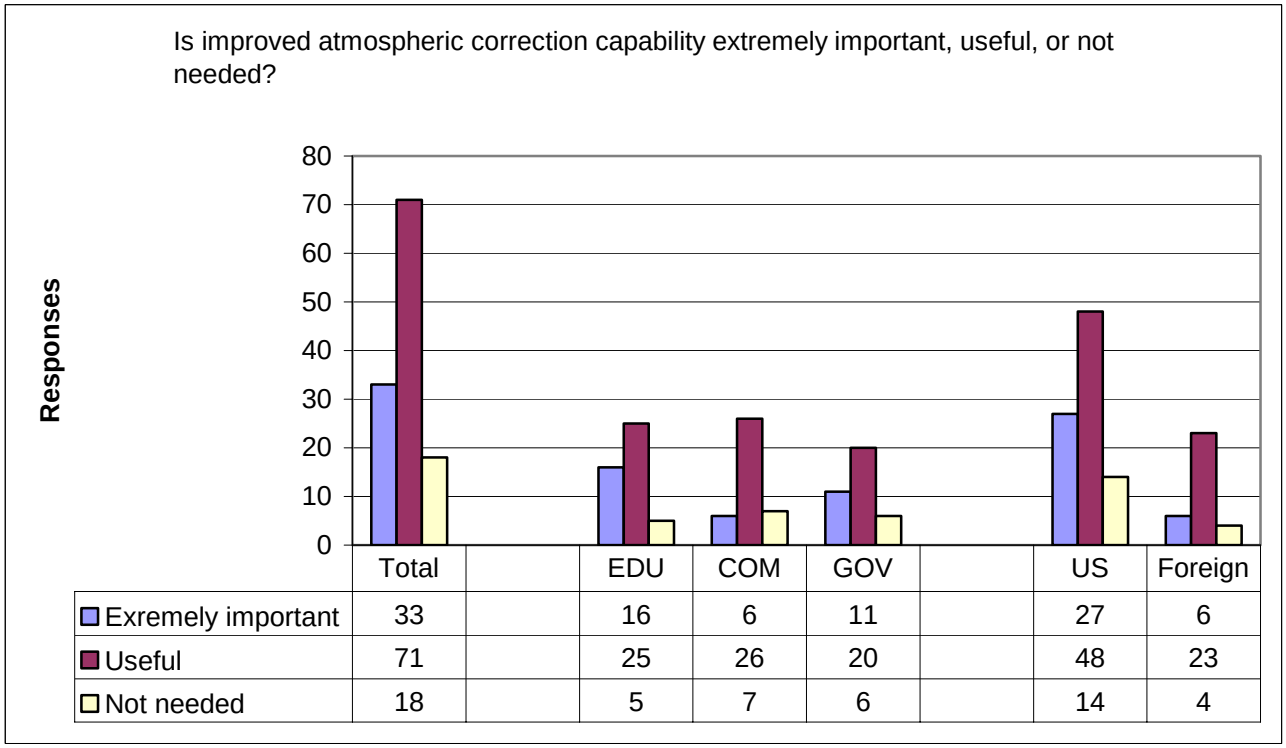
NO RESPONSE	Origin
We are not ready to provide a good answer to this question	EDU

Data Correction Practices: continued

Is improved atmospheric correction capability extremely important, useful, or not needed?



	Total		EDU	COM	GOV		US	Foreign
Exremely important	27%		35%	15%	30%		30%	18%
Useful	58%		54%	67%	54%		54%	70%
Not needed	15%		11%	18%	16%		16%	12%

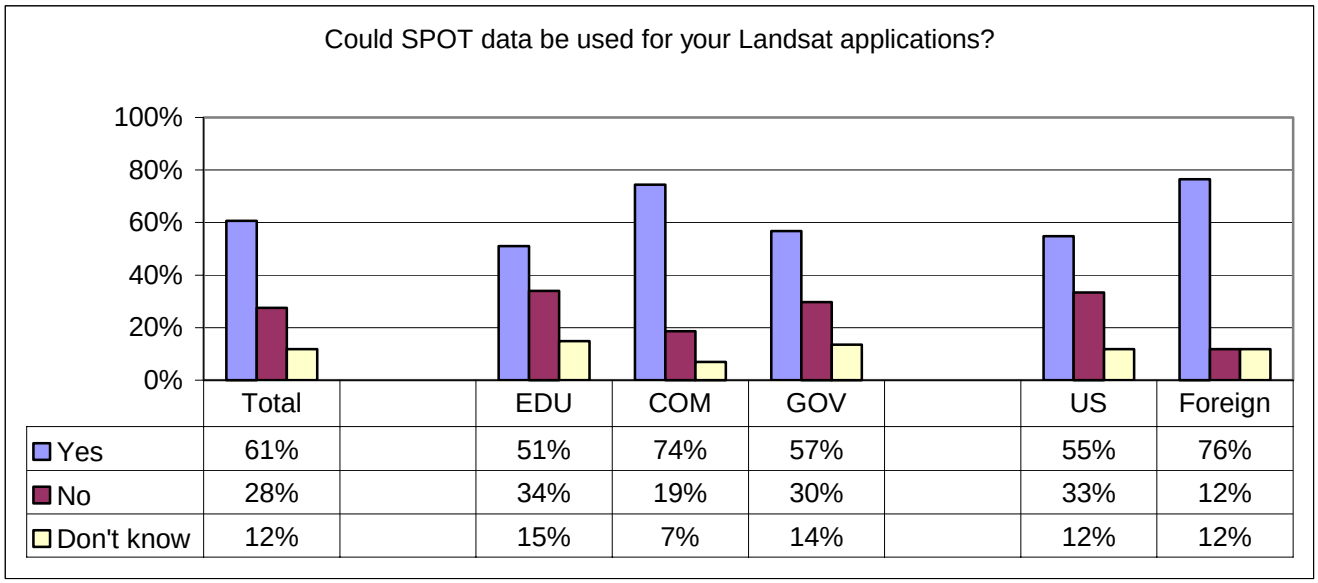


	Total		EDU	COM	GOV		US	Foreign
Exremely important	33		16	6	11		27	6
Useful	71		25	26	20		48	23
Not needed	18		5	7	6		14	4

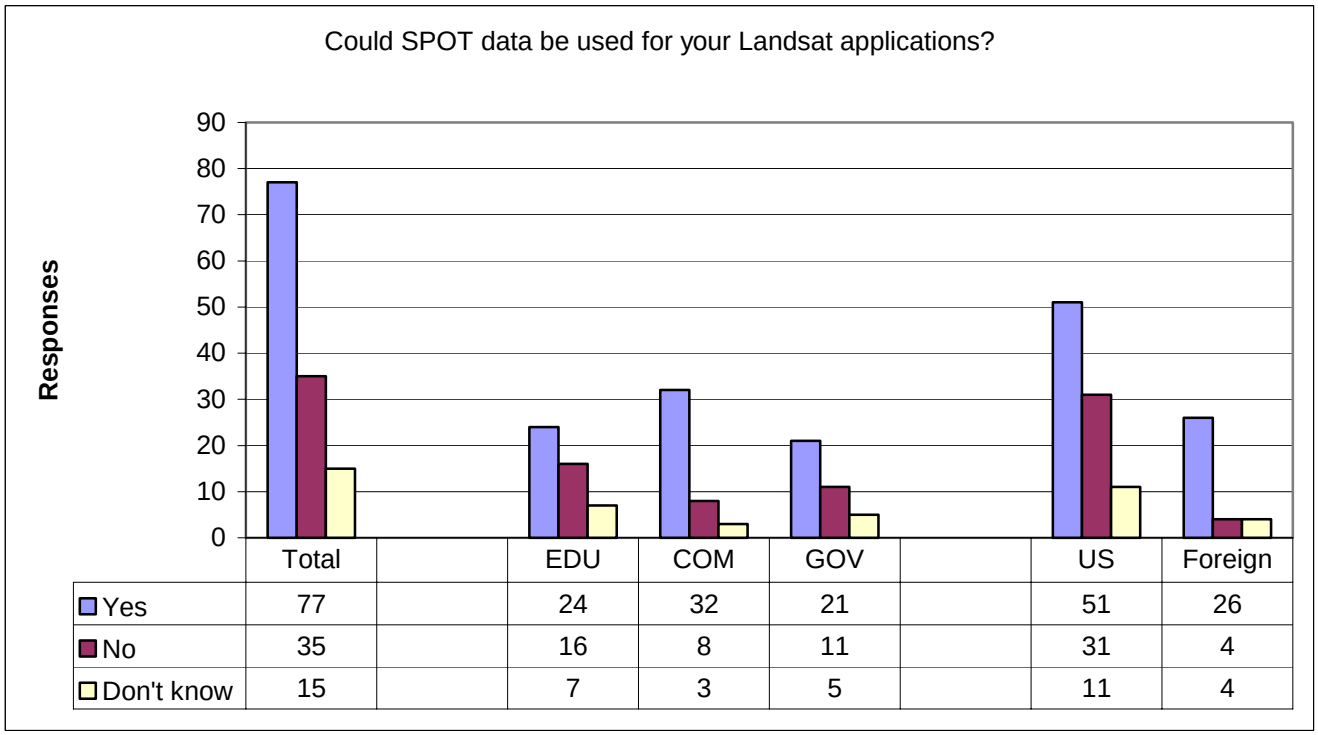
No Comments requested for this question.

Other Satellite Data:

Could SPOT data be used for your Landsat applications?



	Total		EDU	COM	GOV		US	Foreign
Yes	61%		51%	74%	57%		55%	76%
No	28%		34%	19%	30%		33%	12%
Don't know	12%		15%	7%	14%		12%	12%

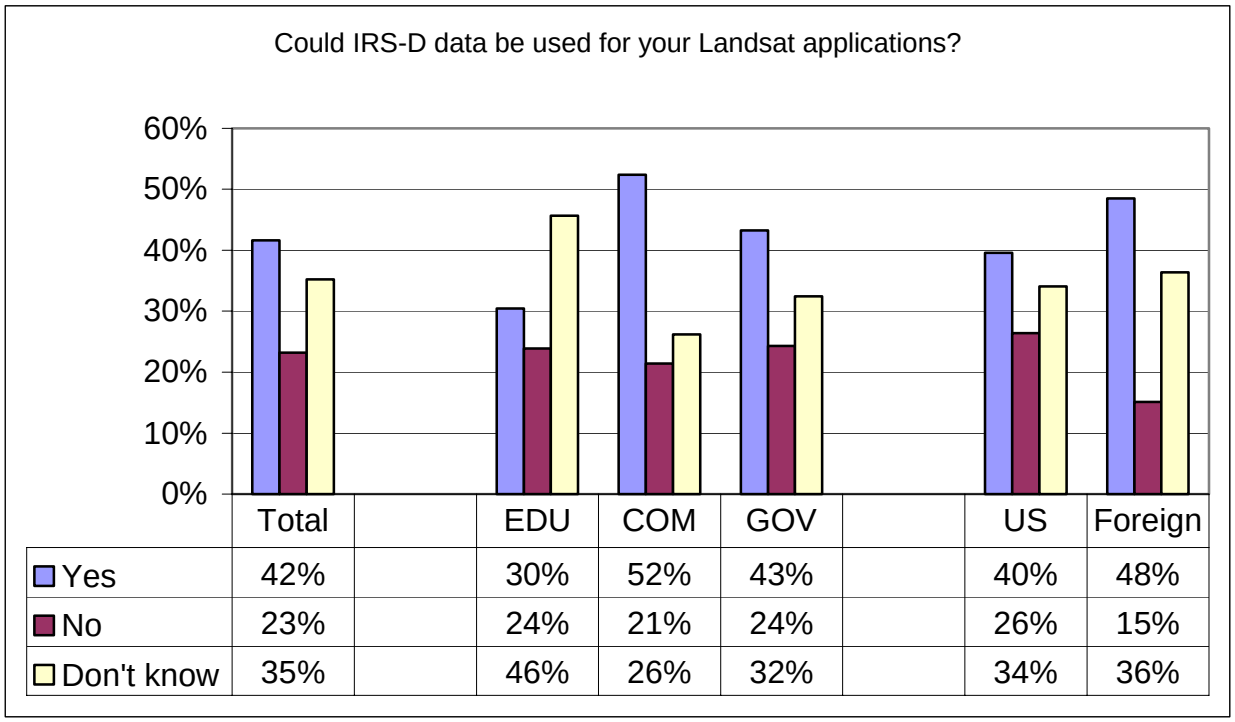


	Total		EDU	COM	GOV		US	Foreign
Yes	77		24	32	21		51	26
No	35		16	8	11		31	4
Don't know	15		7	3	5		11	4

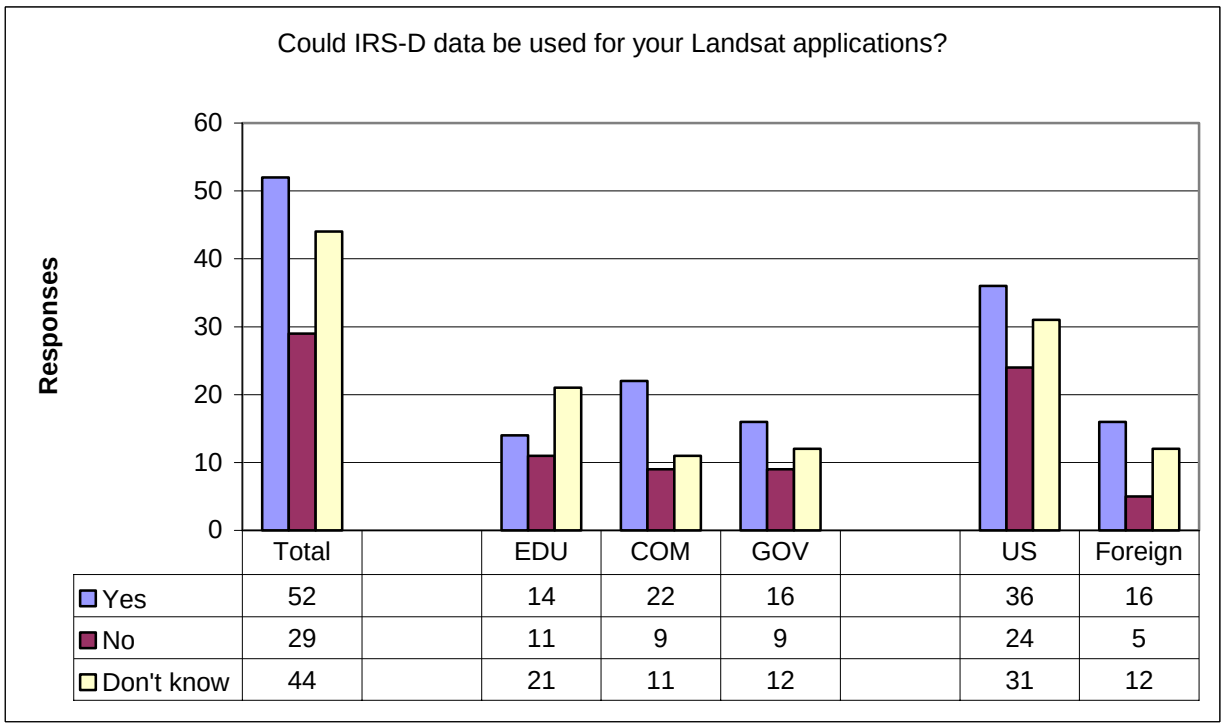
No Comments requested for this question.

Other Satellite Data: continued

Could IRS-D data be used for your Landsat applications?



	Total		EDU	COM	GOV		US	Foreign
Yes	42%		30%	52%	43%		40%	48%
No	23%		24%	21%	24%		26%	15%
Don't know	35%		46%	26%	32%		34%	36%

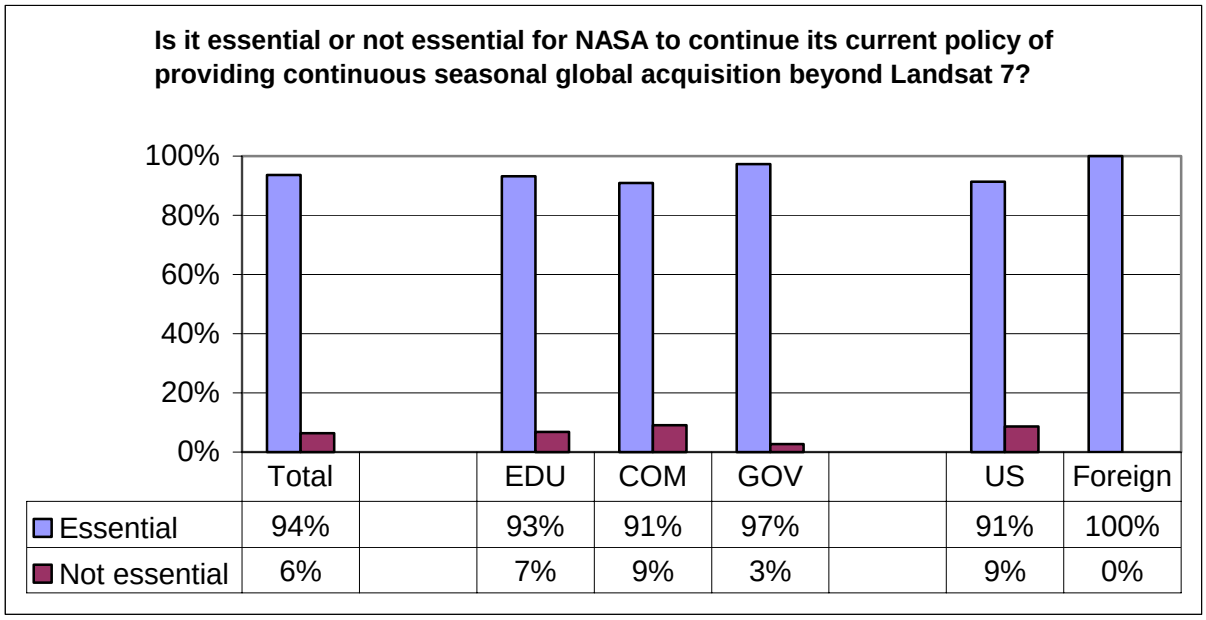


	Total		EDU	COM	GOV		US	Foreign
Yes	52		14	22	16		36	16
No	29		11	9	9		24	5
Don't know	44		21	11	12		31	12

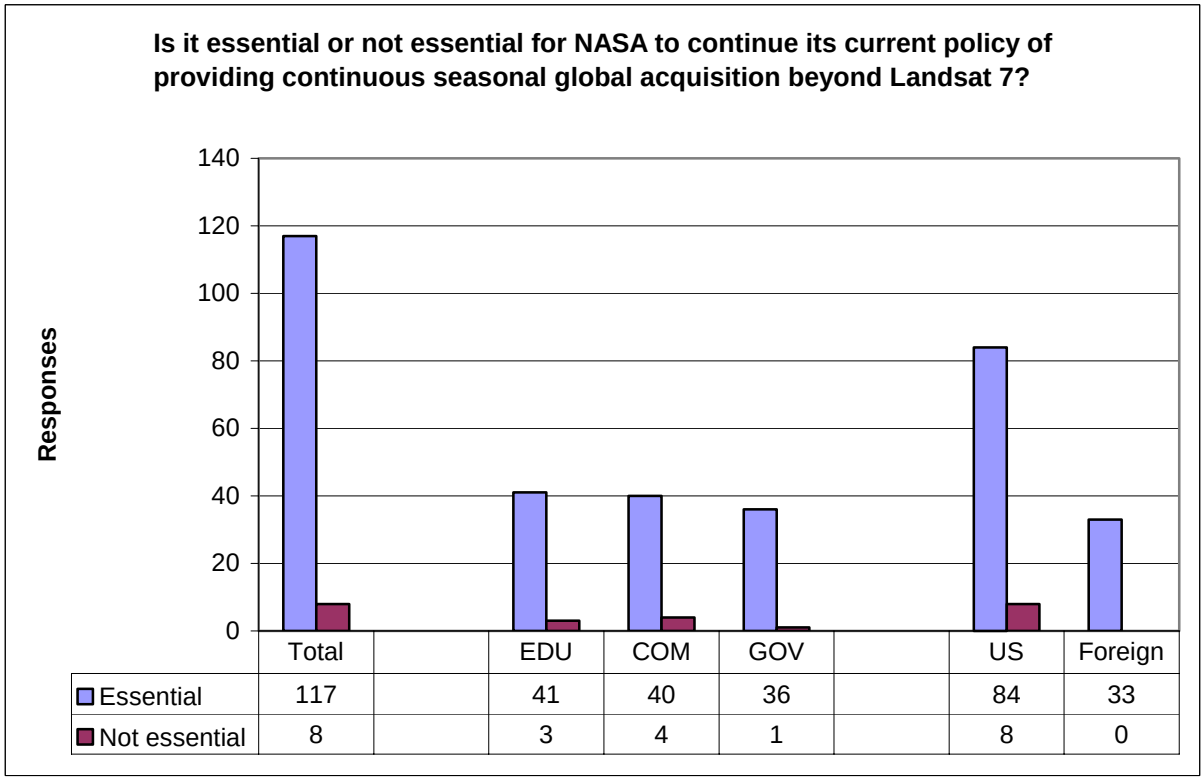
No Comments requested for this question.

Policy Comments:

Is it essential or not essential for NASA to continue its current policy of providing continuous seasonal global acquisition beyond Landsat 7?



	Total		EDU	COM	GOV		US	Foreign
Essential	94%		93%	91%	97%		91%	100%
Not essential	6%		7%	9%	3%		9%	0%



	Total		EDU	COM	GOV		US	Foreign
Essential	117		41	40	36		84	33
Not essential	8		3	4	1		8	0

Is it essential or not essential for NASA to continue its current policy of providing continuous seasonal global acquisition beyond Landsat 7?

***Comments*:**

ESSENTIAL	Origin
This is a recurring debate in the history of the ERTS/Landsat series of satellites, and it should just be dropped. Landsat is one of the most useful, innovative, and revolutionary programs for mapping ever in the history of science. It is an asset of inestimable value, and the costs involved with sustaining the program are vanishing small in comparison to the benefits received worldwide, and in countless fields of science and technology.	COM
(Not sure if I understand the question - as opposed to having no more satellites similar to Landsat7 after its life?)	GOV
As we continue to intensify land management, the need for medium resolution remote sensing products increases as a consequence. I foresee a continuing increase in need for Landsat-type data.	GOV
1) Landsat has a considerable heritage and provides an existing data record with the same approximate characteristics. 2) To study global change we need a continuous global record. 3) Moderate spatial resolution sensors (e.g. MODIS) require high spatial resolution sensors (e.g. ETM) for validation purposes and as part of a multi-scale global observing strategy. 4) NASA plans to continue the moderate spatial resolution data record through NPP and NPOESS. The scientific community, and the applications community when they catch up, requires a similar continuity from Landsat like sensors.	EDU
Based on work with the commercial sector no one in the world has the capability to provide continuous seasonal global data. Given that global climate and land change is only going to accelerate during the next 30 years it is extremely important to maintain the continuity of this unique data set. The commercial sector cannot be relied upon to provide the type of data required before at least 2010.	COM
Because of advances in computer technology Landsat 7 satellites and those beyond have become global sensors for LCLUC information. Data of Landsat's resolution are critical to understanding changes brought about by humans.	EDU
Cloud-free Coverage for global geological purposes is still very scattered and incomplete for many regions. Commercial data is much too expensive for my [university] purposes	EDU
Continuous global monitoring of deforestation and land cover change is now technically and fiscally possible. A reliable source of data is the unknown ingredient.	COM
Essential as far as local station reception is concerned, open data distribution system maintained, and on board recording option preserved... No commercial system as reached the "popularity" of Landsat program and data so far !	GOV
For timely crop acreage estimation it is essential to have 8 day or better coverage. 16 day coverage becomes marginal. Cloud cover is a key issue in timely crop monitoring over short time windows and doubling the probability of cloud free data is a major issue.	EDU

ESSENTIAL	Origin
Having a consistent-standardized data set is essential to evaluating global changes. The Landsat program has over 20 years of continuous data for researchers to use, easily making it one of the most important data sets ever collected, whether the topic is climate change, land-use change, urbanization studies	GOV
I feel it is one of the most important data sets in existence - just take a look at the white literature and you'll see and endless array of applications from rock outcroppings for mineral exploration to coral reefs for environmental monitoring - Not to mention that L5 should get credit for being one of the most useful pieces of hardware of the high tech modern era, from the standpoint of application and durability.	EDU
I have one algorithm that automatically maps the best areas in natural terrain for landing an aircraft for an aerospace company. It uses ETM bands 1-5 and 7. I created another algorithm for mapping toxic algae in Lake Erie, it uses 4 bands of ETM (including band 7). I am working on other algorithms, using older LANDSAT TM data to test them. If you drop a band, these algorithms are worthless and have to be re-created with new, repetitive coverage data. Now, how many other experienced LANDSAT users world-wide have done similar things? Are you really so dense as to consider dropping any of the bands of LANDSAT TM, or changing their spatial resolution? Would you throw away most of what has been accomplished? Don't forget, we need a historical record to produce time-dependent algorithms. If you change TM, that throws away the historical records for that purpose. BE REASONABLE	EDU
Improving spatial resolution	EUD
It is essential to maintain the long-term moderate spatial resolution archive. Landsat is an incredible resource that should be maintained in the future.	GOV
it is not critically important, but I like NASA to strive to provide timely and accurate data.	GOV
It is now very hard to have historical Landsat images when one works on a project at foreign countries because of Landsat-5 data policy and costs. Hope this will not happen again, so we can really monitor and study the dynamics of Earth's surface.	EDU
It would be irresponsible for the US govt. to abandon global monitoring. It is important for the US Govt. to maintain a global archive of moderate resolution (10's of meters) satellite imagery but NASA may not be the appropriate agency to do this. A civilian analogue to NIMA should be considered.	EDU
It would be useful if scenes archived by local receiving stations could be found in the EROS-data center and USGS archives.	EDU
Landsat 7 is a valuable resource for the United States and the rest of the world. I believe the Landsat 7 team has done an outstanding job with design, launch, and data delivery. I do not believe the quality of the data from SPOT or IRS-D eve compare to that which I have obtained from L7.	EDU
Landsat 7 revitalized the satellite mapping services. We need it to continue and hopefully improve	COM
Landsat is a great "all-rounder". Its record is long and there are few enough cloud-free scenes that it would be a sad day if seasonal collection weren't continued. Now	EDU

ESSENTIAL	Origin
that the cost is down to something affordable, I will be buying many more scenes and can at last really begin to make use of the seasonal data because I can afford to.	
Landsat is the only system which provides data which give a long term change detection capability with a continuous (archive and recent) worldwide coverage. This is essential for any environmental analyses identifying trends and processes. All other satellites provide a very patchy archive (IRS and Spot) or are coarse resolution and cannot be used for local or regional projects.	COM
Landsat is unique in the remote sensing world. it is the only long-term, continuous satellite coverage provided for mapping, monitoring, and change detection. it would be a tremendous loss the numerous niche communities where Landsat is the only viable satellite tool.	EDU
Many reasons: - Five yearly State of the Environment Reporting - Change detection against old images - Most cost effective medium resolution data source	COM
Multiyear studies that tie to historic patterns is important for many sectors of applications -- agricultural, forestry, and land-cover in general among these.	COM
My applications require satellite images of Landsat-type description to be easily searched and ordered, at a reasonable cost, and to have no proprietary restrictions. Many of the images are used in multi-year change-mapping projects, so Landsat continuity is important.	EDU
One of the main applications of Landsat data is change detection. Maintaining continuity for change detection is vital.	GOV
Out priorities are as follows: 1) United States 2) North America 3) Global	GOV
RADARSAT and TM, ETM+ are the workhorses of the industry. Cancel Landsat and the follow-on sensors and you severely hamper if not cancel regional GIS analysis in government, academic research and industry. Such a setback would be a intellectual retreat to the dark ages. Such a suggestion can only be based upon shear ignorance and apathy for protection of the environment in the face of man-made development from economic necessity. Anyone suggesting such should be forced to freeze in the arctic without mined or farmed products! Cruel suggestion.....	GOV
Satellite images provide a means of measuring and monitoring long-term changes over vast regions. This is becoming more important today.	EDU
Sometimes SPOT data can be used instead of Landsat but some geological or large regional applications SPOT can not be used. 1.via this scientific organization has a chance to have data	COM
Strictly speaking, for our purpose all necessary images have already been acquired, assuming Landsat 7 covers the globe and that the same spectral acquisition has been conducted on each image. Using Thematic Mapper for geological mapping purposes, we do not need seasonal variations. However, on behalf of fellow earth scientists and geographers alike, I would recommend NASA to continue their Landsat mission. With the present environmental changes, we have a common responsibility to monitor Earth's changing climate, and therefore also the related changes in land surface cover, in order to be able to create environmental policies that will keep our planet hospitable for the generations to come	EDU
The commercial data is too expensive.	GOV

ESSENTIAL	Origin
The continuous global seasonal Landsat data is incredibly valuable for studies of wildlife and ecology and conservation. I am using this data to design long-term conservation measures for endangered species in the Sahel of Africa. The study is based in an extensive wilderness and the information from the Landsat imagery could not be gathered in any other way. Landsat imagery is essential to understanding ecological change over time and assessing the needs and threats to species.	EDU
The data collection is an essential investment in earth science.	GOV
The global acquisition insures that other Landsat distributors e.g. Eurimage does not increase the data cost to an outrageous level. Multiple use is also only facilitated by the data policy for the scenes provided from the USGS/NASA	GOV
The Landsat program provides the ONLY long-term continuity for change-detection and other long-term applications. This continuity MUST be preserved, and not lost in the rush to commercialization. High-spatial-resolution sensors may be appropriate to leave to the private sector, but the Landsat program provides public benefits that go FAR beyond the apparent market value of the data.	EDU
The Landsat series of satellite are providing invaluable time series of data for polar regions. Limitations are cost, and inability to either acquire data over area of interest in early phase of programs with L-4, and cost of acquisition through EOSAT.	GOV
The more data the better.	GOV
The nation suffered a critical loss of resources when we set our previous Landsat to collect data only when there was a buyer. How will be able to measure the effect of our various US and non-US, and collective actions if we do not have continuous seasonal global Landsat acquisitions.	GOV
The world is rapidly changing, so is the land use and land cover. This needs to be monitored and Landsat is the best because of its spectral and spatial capabilities. Other satellites are too expensive.	COM
This cannot be stressed enough! Why is NASA even considering not continuing the Landsat mission, and nearly 30 years of data continuity?!!!	GOV
This is essential and should be a top priority for NASA and USGS.	EDU
This is more than important it is critical. USDA/FAS is relying more and more on remotely sensed data to support food security, food aid, and provide crop production estimates for the WAP (federal economic indicator). Currently, USDA is relying more and more on foreign satellite imagery sources, while numerous countries are successfully launching and exploiting satellite imagery for agriculture monitoring. Not only should the Landsat series be continued it needs to be improved and enhanced (better temporal resolution of all areas of the US	GOV
This will depend on the resolution and wavelengths offered by other satellites.	COM
VERY IMPORTANT!!	EDU
We are prototyping an application of ETM+, which would require long term planning of the mission in an operational context.	GOV
We have to have monitoring of (a) oceanic phenomena, (b) desertification and deforestation (c) volcanic and landslide hazards (d) fires, (e) oil spills (SAR doesn't	COM

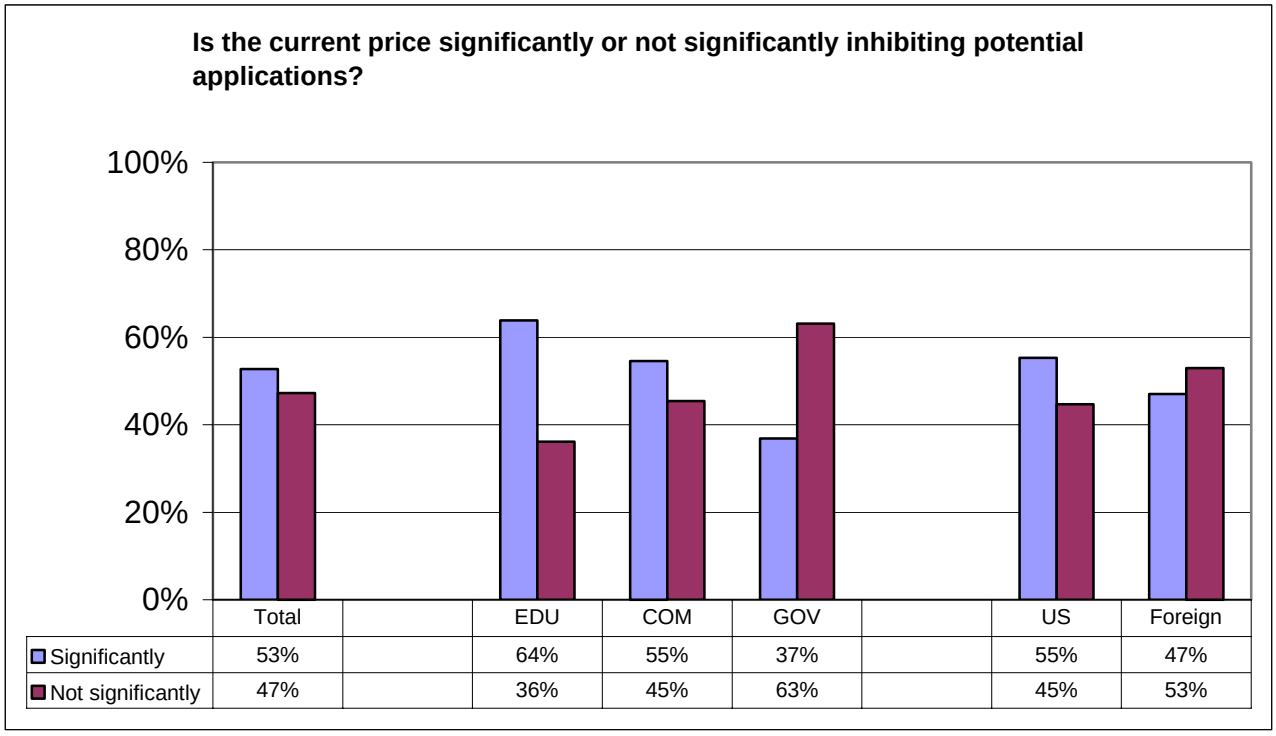
ESSENTIAL	Origin
do it all!), (f) coastal changes. SPOT will not handle geological and some oceanographic problems because of the lack of >1.0 micron bands, and IRS D also lacks these and does not have enough dynamic range or S/N ratio.	
We need these data for establishing long-term land condition records.	GOV
Without LANDSAT 7 (considering both cost and global coverage), we would not be able to have increased our imagery production to the level it is today. Without LS7, we would have to refuse many of our product requests that are currently filled using LS7.	GOV
YES!!! US has the technology... The world is a big place and there can never be too much baseline data!	EDU

NOT ESSENTIAL	Origin
Continuous data is not that important. All projects we do are within the U.S. No need for global acquisition.	EDU

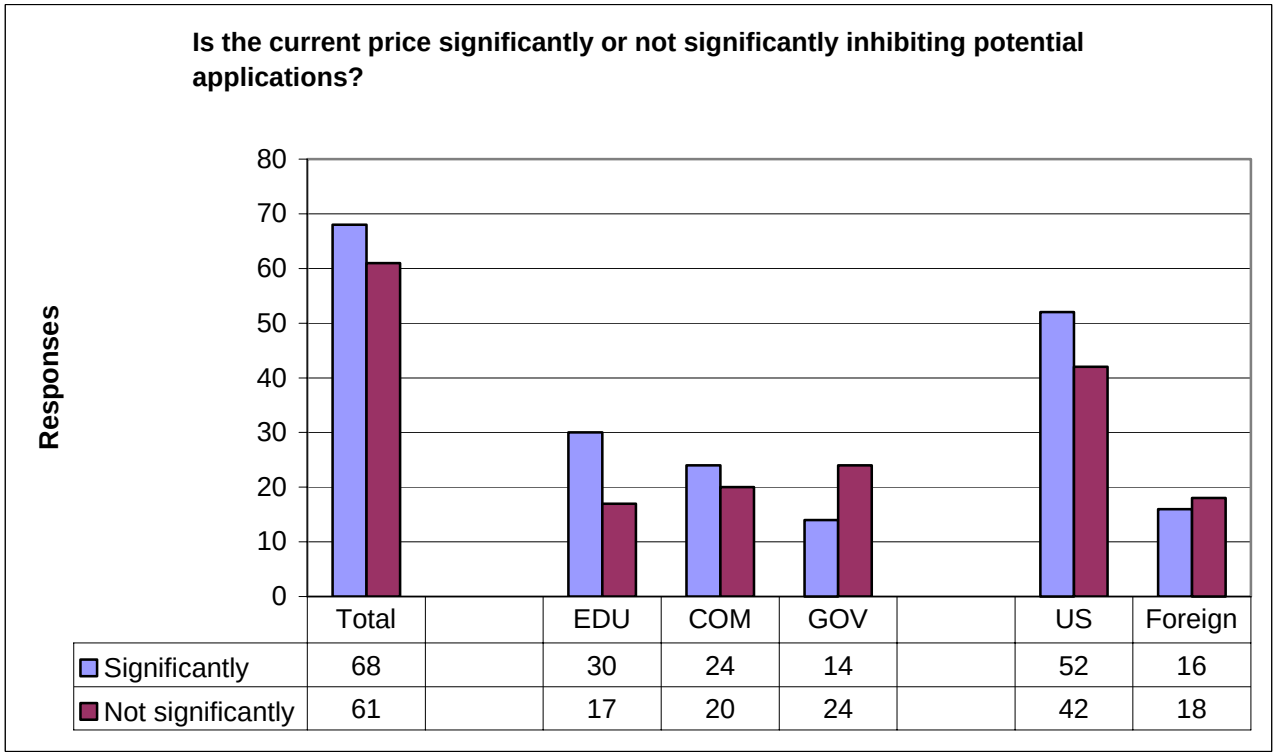
NO RESPONSE	Origin
See above comment about current coverage outside the US.	EDU

Current Price:

Is the current price significantly or not significantly inhibiting potential applications?



	Total		EDU	COM	GOV		US	Foreign
Significantly	53%		64%	55%	37%		55%	47%
Not significantly	47%		36%	45%	63%		45%	53%



	Total		EDU	COM	GOV		US	Foreign
Significantly	68		30	24	14		52	16
Not significantly	61		17	20	24		42	18

Is the current price significantly or not significantly inhibiting potential applications?

Comments:

SIGNIFICANTLY	Origin
Cost is always a factor, but projects very commonly find ways to adapt to the costs of the data.	COM
$600 is a far cry less than previous Landsat pricing. if the price were lowered it would allow for researchers worldwide a far greater access to useful data.	EDU
For Research - Yes	GOV
Of course, lowering the current price would help more users for utilization of Landsat data. So, if there would a chance to lower the current price, it will be good. However, the current price is affordable especially if compared with the $4400 US L5 previous price.	GOV
1) The cost of processing a scene for agriculture or land use change can be as low as $150/ scene in volume production. 2) In volume production, the $600 data cost adds up very quickly and dwarfs the processing costs. 3) Copying 500 megabytes costs at most $25. 4) Current pricing is a significant inhibition to utility.	COM
Although $600 for a scene of ETM+ is a bargain, lowering the price by an order of magnitude would facilitate greater usage.	EDU
Any price reduction would make the data more accessible, especially to K-12 educators.	COM
Cheaper frames would be nice	GOV
Cost is always an issue. After the previous cost regime, this seems like heaven, but there is not any doubt that my students and I would be trying all sorts of new things, for all sorts of new areas, if the cost were lower.	EDU
During my four years of high school I conducted a study of turbidity levels in the Cartecay River and four of its tributaries. My final year was devoted entirely to analyzing the watershed using GIS software and data. Since the only available land cover data I could find was from 1988 I used ERmapper and a Landsat 7 scene to produce recent land cover data. ArcView GIS software and ERmapper imagery analysis software were both provided to me free of charge by the respective companies, but I was forced to pay full price for the Landsat data. $700 is a lot of money for a high school in rural north Georgia with only 800 students. If I had been able to purchase Landsat data at a reduced price I would have been able to not only conduct a more conclusive study by incorporating several scenes collected over a period of time into my analysis, but also I would have been able to save a huge amount of time that I spent looking for other options, and finally getting my school to approve the final p	EDU
However, $600 per scene is a huge improvement over EOSAT, just one of Reagan's dumber legacies!	GOV
I am ambivalent about this question. $600 is a LOT better than the $4000 that EOSAT used to charge (maybe Space Imaging still does charge this much, I don't know), and for many single-scene purposes it is quite affordable. But if the scenes were on the order of $50-$60 each, other applications might become more cost-effective.	EDU

SIGNIFICANTLY	Origin
I believe that there would more data users if the prices were reduced by at least 50%. Many researchers are looking towards ortho processed products, rather than the map oriented products. Often times, maintaining the infrastructure to ortho-rectify one's own imagery (time/resources) is too high. Minimizing the cost of the data could potentially 1) increase users, and 2) facilitate the use of precise geometric data. Another option would be for USGS/EDC to offer more substantial processing for the current $600 L-7 scene	GOV
I bought some sample CDs but price is way too high to permit me to buy actual images for areas I working/teaching with so much of above is based on test images and what I know what I would need/want if I could actually afford the images.	EDU
I have always felt that the data is too expensive. I don't understand why so much money is charged for research/educational use.	EDU
I have purchased data only for immediate areas of current interest; if price was 100-200 per scene rather than 600, I would probably purchase 3-6 times more. My application only requires cloud- and snow-free images, and seasonal repetition is not essential; however, I can understand that those who do require repetitive coverage would find the current price ten times too expensive.	EDU
I still have to spend $600 per scene, which limits me to just a few each year, in my budget. I have to apply for grant money for any more such scenes.	EDU
I suppose this depends on the funding source for the users and the geographic scope of their project. For users with large grants and a study area spanning 1-2 scenes, the price is not very inhibiting as it is much more affordable than Landsat 5. However, for those users with limited funds and a larger study area, the price is limiting. I currently work on one project funded in the million+ dollar range and another project with only a few tens of thousands of dollars. The million dollar project makes good use of Landsat data and is barely affected by the cost of Landsat 7. However, in the other project we have had to reduce our study area to fit within one Landsat scene in order to fully utilize a time-series of imagery	EDU
I think really the answer is somewhere in between significantly and not significantly. Landsat 7 is already attractively priced. A lower price would result in greater usage.	EDU
I work for a NGO, we rely on grants and foundation support for the majority of our work. We currently utilize resources like the Conservation Technology Support Program www.ctsp.org this coalition (ESRI, HP, and others)provide hardware and software support to conservation NGO's Landsat would do well to include themselves into this group. Our budget is tight, it is a big deal when we drop 700 bucks for a scene.	GOV

SIGNIFICANTLY	Origin
I would certainly make much greater use of data in archives if cost were lower. Research budgets are typically small and this is the critical limiting factor. On another matter, I have a current NASA supported project and need to pay reproduction costs for data, but these have been set same as EDC charge so what is point of making effort to apply for a research project. As non-US researcher I do not have access to NASA or other US Govt. funds. I do formally access the USGAU rate for purchase of data from EDC when less than 10-years old. Where possible, researchers in the Antarctic science/glaciology community have organized themselves in order to leverage better prices, negotiate with EOSAT many years ago for an Antarctic acquisition program, etc. This collaboration has made a number of things possible, but has not provided data at low cost, commensurate with the size of typical research budgets..	GOV
If Landsat is to become a widespread source of imagery for regional to global scale studies, the price still needs to come down significantly.	GOV
Landsat 7 could be used extensively and very successfully for many educational purposes. With the cuts in funding of education occurring all over the world, budgets are increasingly tight. Investments like the acquisition of Landsat data are likely to suffer the first cuts. With a great reduction in price, many more government funded organizations would be able to use Landsat data. This would not only increase fundamental understanding of our (changing) planet but also the number of people that know how to work with GIS applications.	EDU
Landsat data capture change at the human scale. MODIS does not. Investigations of change will require the use of an increasing amount of Landsat imagery because multiple images will be required to cover the larger areas. This is a very price-sensitive market for academic and government research organizations. The history of Landsat illustrates this. If Landsat data are priced above ASTER and MODIS products, the researcher will bear the agony of mosaicing ASTER or losing spatial clarity of MODIS to do their research	GOV
Low pricing is helping to develop remote sensing technology but with a low price distributors gains almost nothing. Selling Landsat data is not feasible for distributors with current prices (EDC and others announcing prices via internet and customers requesting data with EDC prices, how and from where distributors get their commission?)	COM
Lower price would enable us to purchase much more imagery for time series work	EDU
Lower pricing would give us more flexibility - acquiring more scenes and composing for cloud free coverage more frequently.	GOV
Multi-temporal and large area studies rapidly become too expensive still, but it is a LOT better than it was at $4400 per scene. But cost is not the only problem: many earth processes have a much faster rate of change than once in 16 days. Mesoscale oceanic gyres, for example, require 24 hours or less. I have recently suggested that we should look at putting "Space Imaging-type" optics at Geostationary: that would get us Landsat type resolution, and very high frequency revisit.	COM
On the other hand, I would hate users to simply purchase data for the sake of filling up their cheaply purchased empty hard drives...	EDU

SIGNIFICANTLY	Origin
Price is NB for research.... piles of cash aren't always available..... HOWEVER... fix up that Landsat archive... make consistent metadata, document PROPERLY ALL data legacy issues... Get ALL Landsat Data EVER collected and get it into a consistent format... then let the games begin!	EDU
Private sector consulting may utilize remotely sensed data more if prices came down...too hard to include in competitive bid situations	COM
Probably many small agencies (county, local) cannot afford it	GOV
Raising money for satellite imagery is my biggest struggle as a graduate student. Each image is like gold, it gives me months of essential data and gives me months of work to do. The more images I can afford, the better I can understand ecological dynamics over time, design models, create conservation plans and make predictions. If I could buy images every month or 2 months, I could do an incredible PhD.	EDU
The current price is a true progress. Even though we are not yet concerned -since we are at the stage of feasibility studies- we think the price will be a handicap when moving to marketable application	GOV
The price is prohibitive for global applications, however much better than previous pricing which made it impossible to do even regional studies.	EDU
The price isn't always the issue it is justifying the price for the net gain of the project. Cost/Benefit	XXX
The situation has improved with Landsat 7, but cost is definitely prohibiting many applications.	COM
This is the most critical issue for us, we are a nonprofit doing environmentally themed research with other organization in the developing world. Thus, cost is the major issue far and away.	GOV
To get meaningful results, we have to have a statistically significant number of scenes. Ideally, this number would be in the 100's, but at $600 apiece, even with the assistance of funding from the DOE ARM program, we are still limited to buying a dozen or so scenes. This means that we can only get an idea of what is out there. We can't make any broad conclusions about the frequency of occurrence of different cloud field characteristics.	EDU
We are a non-profit conservation organization which means cost is always an issue. However beyond our immediate work, our partners around the world often can not afford even the $600 costs. Reduced costs would greatly expand use of the data.	GOV
We are indeed more able to buy data today than were able three years ago, but the price still inhibits us from many of the scientific efforts envisioned. As well, it prohibits many of our visiting scholars from other nations, with whom we collaborate from gaining appropriate knowledge about their own nations. It forces us to use our grant monies to purchase data for them; we can give them useful skills, but they cannot use those skills on their own, because they cannot afford the data.	GOV
We can not afford the coverage required in Greenland. Perhaps an exclusive usage price could be lower.	EDU
We frequently have researchers from all over the world, with little money for images. They have important projects, with high potential to benefit from satellite images. They just can't afford the cost of images spanning large areas and time.	EDU

SIGNIFICANTLY	Origin
We only buy occasional scenes so it is not often of significance to us. But for applications needed many scenes the cost would be prohibitive	EDU
We produce true-color seamless image mosaics for animation and visualization applications. Our customers are not typically concerned with the science-level accuracies of the imagery. If price was reduced, we could provide more cost-effective large-area products. If it were reduced an order of magnitude, we'd be able to produce cost-effective products and would certainly increase L7 consumption significantly.	COM
We would buy much more imagery were it less expensive. However, we would soon find that the 24-36 hour delay from order to download of data would be a problem.	COM

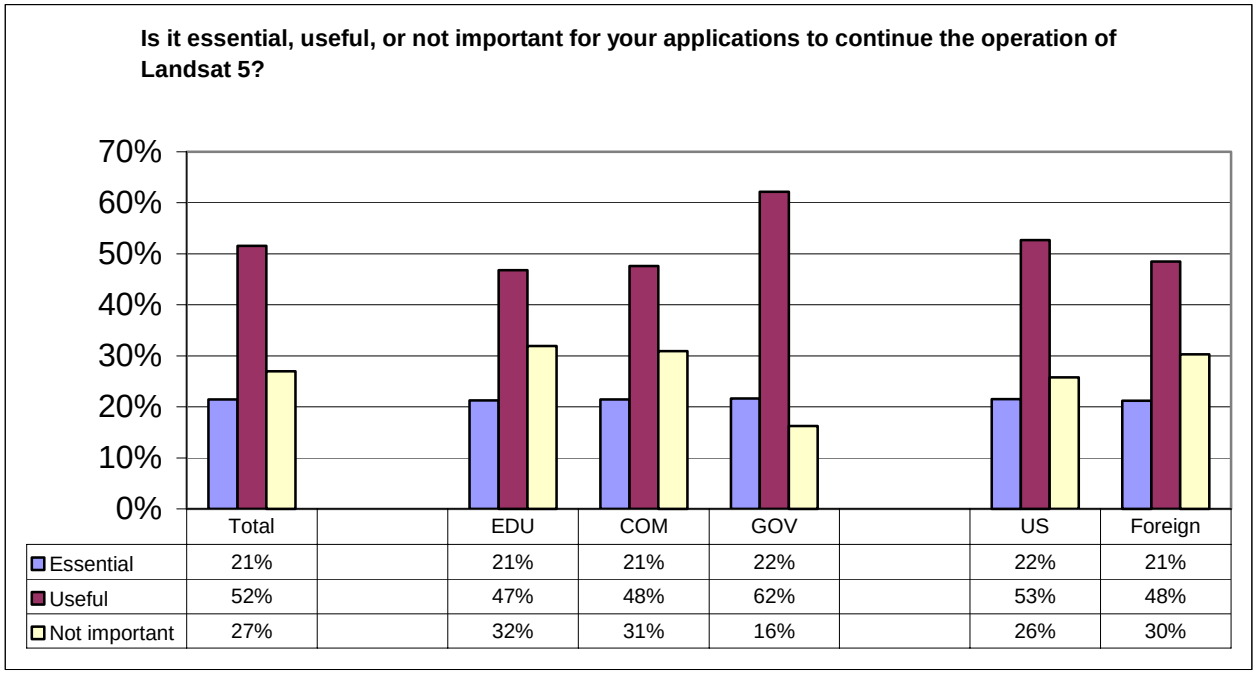
NOT SIGIFICANTLY	Origin
$600 per scene is a fair user tax for users to pay (in addition to the taxes they pay). Since some non-tax-payers also purchase Landsat data, the current user fee ($600) is fair -- especially since unlimited reuse is permitted.	COM
If the price per granule is less than 600 USD then it is not inhibiting	GOV
A paradigm shift is required whereby data buyers redistribute the data to accredited sub-users at reduced or no cost. I believe that the Landsat 7 policy now allows this and that in some limited instances this is happening. For these reasons and cost recovery issues the current price magnitude if correct. Note that for developing countries the exiting $600 sticker price is prohibitive but any price would be also.	EDU
A single application of the data may often justify the price. More important is to maintain the liberal data policy allowing data to be shared in a community.	GOV
Although the cost is not a significant impediment for our organization, it tends to be a limiting factor for state governments and in particular universities.	GOV
Cheaper would allow use to purchase more data, especially for change analysis and crop studies	EDU
Cheaper would be great but I'm not in the mood to hear the explosion from private industry if we lower the price.	GOV
Compared to the cost of products from other imagery sensors, I consider LS7 to be a bargain. But, any price reduction from any vendor enables us to increase our imagery coverage of the world.	GOV
Compared to the Space Imaging/Spot pricing, the USGS LandSat7 pricing structure has allowed us to expand our data production capabilities in the US from strictly urban areas to many rural areas, which has allowed us to dramatically expand our revenues, and provide our services to a much larger portion of the country.	COM
Cost tends to become an issue, when multiple scenes are needed to cover an area of interest, particularly when multi-temporal images must be acquired.	EDU
Fed. Government price is reasonable, but we're not doing global analysis	GOV
For researcher the present price may still be too high. For commercial companies working in supporting environmental studies to present price is fair. Instead of reducing the price, improve the turn-around time.	COM
I believe that the cost is appropriate for the amount and types of data provided.	COM

NOT SIGIFICANTLY	Origin
I think the price is reasonable. Less expensive would be nice, could use it even more often for applications.	EDU
I'm surprised at the users response - compared with the prices of pre-Landsat-7 data the current data is cheap - certainly cheap enough to be able to justify it, although it would be nice it were cheaper!	EDU
If I compare it with Landsat 5 or with other sensors - the price policy of Landsat ETM is marvelous. sure the price could always be fewer.	EDU
if the application is not purely scientific and a "customer/user" benefit can be achieved. Users and customers need to get used to do a cost benefit analysis.	COM
In Ohio we are getting the state to pay for every-time coverage of our state. Other states should do the same, then share the data for education and research. This is the Ohio View model. Education and research are a special case that is crucial to all players in remote sensing, because we need "free" data in the universities, but someone (like the state) should pay for them. Our ability to share with each other and with students makes the research and education possible, thereby creating new algorithms and new employees for industry at the same time	EDU
Landsat 7 data has reduced the cost to about the right level. We would not want to see data too cheap as we like to ensure customers are those with a budget to enable us to provide value added services	COM
Much, much better than a couple of years ago.	EDU
Price is OK, it could be higher for improved characteristics of the images, higher level of processing, accuracy, time for delivery, higher resolution, etc....	XXX
Regarding the path wide, this price is OK.	COM
Still the best bargain out there. Lower pricing may slow other commercial efforts to launch	COM
The 600 and 475 dollars for each image IS NOT excessive (especially if compared with L5, which runs several times more expensive). A lower price would indeed make data more accessible but I would rather have the price of L5 drop to similar levels in L7 that to have a cheaper L7 and an expensive L5.	EDU
The copyright-free policy is extremely helpful! It even makes other satellite data (SPOT & IRS-C) more available. In my opinion, the Landsat-7 data policy is the best thing that has happened to satellite remote sensing The per scene processing fee is no problem at all.	EDU
The cost of the current Landsat TM7+ Data is excellent and has helped us to convince our Clients to use Landsat TM7+ Satellite Images. It's a lot better than the $ 4,500.00 we used to pay to EOSAT.	COM
The more you see of ETM+ datum the more potential applications are apparent but it costs money so you have to limit what you can do with fixed budget. You give away the data and then its taken for granted and ignored. Continuation of the program is necessary so user fees are necessary.	GOV
The price is cheap compared to when EOSAT ran the program!	GOV
The price is low enough, especially if data can be shared freely between users, and given away to NPOs if necessary	GOV

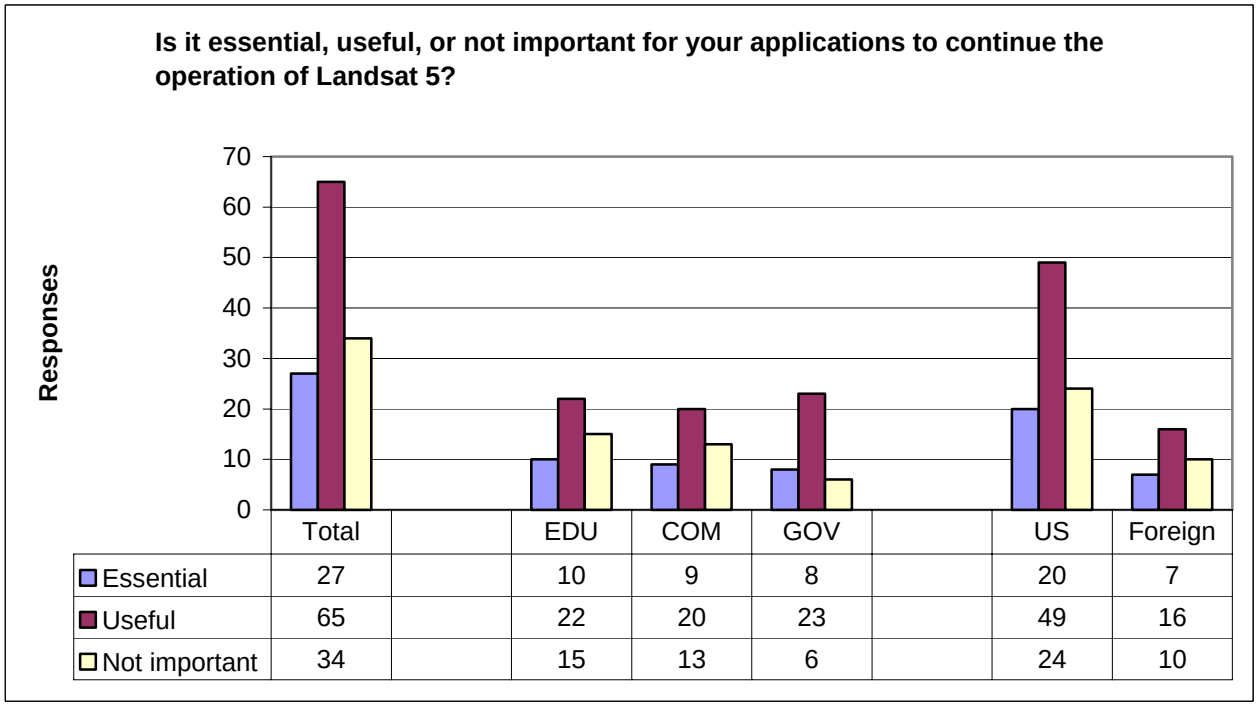
NOT SIGIFICANTLY	Origin
The price is reasonable & the data distribution rights are fare.	EDU
The price of 600 dollars is so inexpensive; everybody should be able to purchase imagery. As there are no royalties anymore, people should be inventive and share data whenever possible.	COM
The pricing structure is good. I feel we get great value and great service (access, order delivery) for the price. If people want to do global-scale projects then they should be using a different scale product. Perhaps adjust the pricing for volume purchasing.	GOV
Those users (demanding ridicously cheaper prices --academics etc.) need a good history lesson. For $600 a scene and essentially registered and license free and comparable with historic Landsat 7 is a real bargain. Pre-buys and partial commercialization will likely lead to a repeated FAILURE of Landsat commercialization. Make Landsat 8 a replica of Landsat 7 and then see if the private sector has had enough time to put up their own systems at those data prices.	GOV
Well, cheaper is of course better. However, simply going from the Landsat-5 policy of $3000 plus proprietary restrictions to the Landsat-7 policy of $600 with no restrictions has been an enormous improvement in getting access to such images for university and agricultural projects.	EDU

Continued Operation of Landsat 5

Is it essential, useful, or not important for your applications to continue the operation of Landsat 5?



	Total		EDU	COM	GOV		US	Foreign
Essential	21%		21%	21%	22%		22%	21%
Useful	52%		47%	48%	62%		53%	48%
Not important	27%		32%	31%	16%		26%	30%



	Total		EDU	COM	GOV		US	Foreign
Essential	27		10	9	8		20	7
Useful	65		22	20	23		49	16
Not important	34		15	13	6		24	10

No Comments requested for this question.

General Comments:

The government is very interested in your overall opinions about the Landsat program in general. Please add any comments and suggestions here.

GENERAL COMMENTS	Origin
Since more than 30 years, Landsat program and its satellites have been supplying the scientific community with invaluable data land resources. Processing and analysis of this data has increased greatly our information about the earth's resources and landforms dynamics. Now and because of current changes in the earth's state and environment, continuity of this role is critically required and essential for better understanding of the earth's state.	GOV
I've found the ordering system, thru Earth Explorer to be very good, easy, ability to get preview, etc. and the CDs were delivered in timely fashion, with no problems	GOV
The Landsat program is terrific, particularly with the advent of Landsat 7. The data quality is excellent, the frequency of acquisition is reasonable and the costs are vastly improved. Data distribution has also worked seamlessly and the copyright free policy makes the data even more useful for our international conservation work.	GOV
The Landsat program is very useful in our agriculture research programs in Mexico, because we need to get recent information about the contamination problems and land use in our Irrigation Districts. Moreover, the cost per scene (granule) is not very high (600 USD, but it could be less), and it is possible to make the purchase thru internet.	GOV
Again, the Landsat program is the international leader in good and accurate data that meets a number of regional scale needs. It has the best temporal and spatial coverage of any satellite, is processed and distributed well, and remains the clear leader. The value of this program cannot be overestimated. It is essential that NASA and the US government maintain this program. There is no commercial substitute, nor will there be anytime in the mid-future.	EDU
Having been a user of Landsat since 1972 for official agricultural statistics purposes (supplemental input to crop acreage estimates for portions of the U.S.), it has been painful to observe the policy failures of Landsat. As engineering goes, the success has been incredible. Great data for many applications. Then premature attempt at commercialization hit and set the U.S. technical leadership in this area way back and let international competitors make great strides. Please let us not repeat this fiasco and as one Congressperson described it at a hearing on Landsat, Let's not snap defeat from the jaws of victory one more time.	GOV
I have found that often both (L7 & L5) generate complementary data (especially to create mosaics). It is very important that both continue to gather information, especially in high cloud areas, so that complete coverage is possible.	EDU
I think Landsat is awesome, many because it has been around for so long. A baseline is important, and the maintenance of data collection is equally important	EDU
I'm very pleased with the Landsat program in nearly all aspects. I would like more frequent converge to compensate for the difficulty of obtaining cloud-free imagery in Alaska and so I hope that Landsat 5 is continued. My only complaint with the program is that lack of a single, well organized means of viewing and ode ring the data. In a current search for Landsat 4 and 5 imagery I used three USGS sites (Earth Explorer, the EOS data Gateway, and GLIS.) Each of the sites returned slightly different scenes and numbers of browse images for the searches that I ran. In addition, I am now having to contract private organizations to find Landsat 5 data not archived in the above sites.	GOV

GENERAL COMMENTS	Origin
In my opinion it is a exceptionally good program that needs to be continued. The quality of the data is excellent and because the price is affordable, temporal analyses becomes possible. This creates new opportunities for value added services and their clients	COM
It is quite essential that the Landsat program is continued by the US government. The uses in third world countries without several resources is very much appreciated.	GOV
It may be possible for commercial providers of multi-spectral imagery (like ETM+) to provide data having a similar spatial and spectral resolution to ETM+ (with the same slowness in availability) from their commercial acquisitions. Commercial companies can retain their full (high) resolutions (spatial and spectral) and quick turn around times (when this happens!) and essentially degrade their expensive data so that it can be released as quasi-Landsat data. This would take the government out of the Landsat business as the primary provider but would leave the government in the role of distributing useful data at government-supported prices.	COM
Landsat TM data is essential to over 200 different on-going activities with our end-users. Some of these activities involve making US agriculture products more competitive. Others involve issues of National Security. Others involve enforcement of illegal drug interdiction. Many involve petroleum, natural gas and mineral exploration. The fiscal benefits to the US economy and security far out weigh the costs.	COM
Landsat's nearly 30 year history of acquisition provides a vital archive for studying global change. Its contribution goes far beyond what can easily be catalogued. The value of data collected in the past continues to grow as we collect new data. The data collected today will be used in applications we can't predict today, and precisely for that reason it is invaluable.	EDU
My country's NE and E parts are generally cloudy therefore only frequent imaging can help us to find cloud free or less cloudy scenes over this area therefore Landsat-5 should continue to acquisition. Landsat data is very helpful and best suitable tool for large area land use mapping, coastal mapping, crop monitoring and geological applications (structural and geological mapping)	COM
Regarding Landsat 5, I have yet to hear a rational argument for discontinuing operation. If the price were lowered to $100/scene and distribution were handled by EDC, the potential applications for Landsat data could be increased substantially.	EDU
Thank you for Landsat, it is our greatest investment in the future of the planet and I feel proud that my government makes it happen. Kudos to all Landsat folks, at every level!!	GOV
The advanced technology of Landsat ETM has opened many new doors for ecologists and wildlife managers. It is yielding data and insights that are entirely new. Buying this imagery saves thousands upon thousands of dollars in field research and increases the accuracy and scope of studies. I am somewhat concerned that the Landsat program is now somewhat behind present day technology. Satellites are now in orbit with far better resolution (1-4m), and with far greater spectral resolution. I can't afford the data from the commercial satellites and those from other governments. US scientists rely heavily on satellite technology for an enormous range of applications. Not only do we need access to the latest technology in satellite imagery, but the availability of this imagery has invaluable uses and benefits for society. Satellite imagery also saves us months and years of expensive fieldwork and greatly expands the time scales and depth of our studies.	EDU

GENERAL COMMENTS	Origin
The low cost and high spectral resolution of the Landsat7 product makes it significantly more useful than the IRS and SPOT products. Maintaining or improving revisit rate, spectral and spatial resolution, and maintaining or dropping the price would be the best future directions for the Landsat products.	COM
USDA/FAS supports any efforts to continue the Landsat program as the Landsat 7 program is funded and managed. The Landsat series for USDA/FAS is not a science program but an operational program that supports our congressional mandated missions to provide critical agricultural analysis for food aid, food security, support of USDA agencies domestic programs, and a global agriculture intelligence system. Note that we plan on purchasing over 750 L5 scenes in FY2001 of the US. We purchased over 1500 L5 scenes of the US in FY2001	GOV
We are very pleased with both the quality of the Landsat data we have obtained and the response time for receiving the data. FTP access works great. A couple times last summer we were able to get imagery to our customers 3-4 days after the scene was shot. It would be nice if orders could be put through on weekends at least during the peak summer growing season. This would really help us out.	COM
We have only purchased a few scenes. I found the process an easy one - we had to rely on Landsat 5 images twice and had to buy the tapes from Space Imaging each time because the images we wanted were not in EDC's database. We thought that those additional costs were high and somewhat unfair. The quality of the Landsat data have been very good.	GOV
Yes keep L5 up there. It is useful for cross-calibration and provides another source of data.	EDU
Landsat program has been a big success and has provided great deal of good quality data to all fields of remote sensing.	COM
Although it was not the original purpose for the deployment of the Landsat instruments, Landsat data is very useful for the study of clouds and their interaction with atmospheric radiation. This is primarily because of the high spatial resolution of Landsat data. I am sure more cloud studies would use Landsat data if a wide variety of data was available at a reasonable price. Landsat sun-synchronous orbit is also a limitation for this work, but I don't expect this to be changed.	EDU
Am really excited about what has been done with your data but I wish costs of acquiring images was affordable....for folks at small schools who are teaching GIS/Remote Sensing the costs are totally prohibitive.	EDU
As I am using Landsat to help map lava flows at an Aleutian volcano for my master's thesis, I don't have a need for multiple images. I appreciate the detail that can be seen in the different bands, which helps to distinguish one flow from another, but it would be helpful to have better spatial resolution (10m or better would be great!).	EDU
I believe Landsat 7 is an extremely useful tool in the mining and exploration industry where the area of interest can often be large. The addition of the Panchromatic channel has been a major benefit to Landsat 7. It would be great to be able to purchase an orthocorrected product in the near future and if possible have a product with improved resolution.	COM
It is economically and environmentally essential.	GPV
Landsat 5 is really hard to know how to calibrate which limits its usefulness to me.	EDU
Landsat 7 data was very useful and I see using it more in the future.	COM

GENERAL COMMENTS	Origin
Landsat is a service, like weather reports, libraries, the internet, and air traffic control, which is essential for making the modern world work. It is an appropriate role for government. I am not confident that these services would be adequately provided by profit-motivated industries.	COM
Landsat is to date an unique source of information for studies requiring seasonal data. Positive points are: rich spectral content, large width of scenes, 16 days revisit period, friendly data gateway, fast data delivery Negative points: lower sensitivity and resolution than SPOT and IRS A more specific remark: it is often very valuable to be able to match Landsat data, that are very suited to regional applications, to higher resolution data: SPOT-PAN, but even IKONOS, or reversely, to low resolution global data (AVHRR). When doing this, one always has to perform the tedious work of switching between different data formats, different calibrations, etc., before any further processing, including the conversion from one geographic system to another. More data standardization between Landsat and similar systems, and well documented procedures for switching from local (UTM) data to global (WGS) would be appreciated.	GOV
Please consider the following suggestion very carefully. On your search engine website, where people go to buy Landsat scenes, it may be a good idea to put a conspicuous warning, to WARN all ER Mapper uses to buy the Landsat 7 GEOTIFF format and NOT the HDF format. Please add that ER MAPPER does not support HDF fully (if that is legally allowed). The exact truth is that although ER Mapper allows you to import HDF files, you lose ALL geocoding information, as you have to import by binary BSQ format, as their HDF format does not work. Their technical officer's response to queries of end-users on this topic is as follows: Er Mapper's technical officer's response to queries of end-users on this topic is as follows: www.ermapper.com -Original Message- From: ermapper-l-owner@ermapper.com Author: Scott Shepard Date: 06 Jun 2000 Email: Just a message from ER Mapper Technical Support, Americas Region: ER Mapper DOES in fact support Landsat imagery in HDF format as discussed in the ER Mapper	EDU
Please keep it going - the cost relative to the public benefit is huge, when compared to, for example, weapons purchases, the space shuttle and space station, etc.....	EDU
Re: Landsat 5 - Not available in Australia, so it would only be useful if the cost and license conditions changed to match Landsat 7. Two satellites would then be useful. The Landsat program is very important, in the current RS industry. I don't have sufficient information to predict if this will be true in, say, 5 years.	COM
The Landsat program has been very useful to us. Landsat 7 has made getting up-to-date coverage for our geographic area of Michigan very easy to do. The $600 cost is very affordable. In my opinion finding SPOT or IRS data has been a pain. The Internet tool to browse and select images is real nice. Service from USGA has been real good.	EDU
The Landsat program is extremely important to numerous researchers. but I believe in order for the program to continue to be effective, there must be solid representation from all scientific communities who hold a stake in the use of the data.	EDU

GENERAL COMMENTS	Origin
The Landsat program is worth far more to the people of the US than its cost in dollars. It would be a sheer tragedy if a short-sighted focus on commercialization resulted in a loss of its usefulness. Being able to share data without copyright is VERY important. The field of remote sensing was significantly set back by the commercialization of Landsat-4 and -5 in the mid 1980s. We need to increase, not decrease the public investment in the Landsat program, preferably with multiple satellites in operation simultaneously and greater ease of access to data. The LightSAR program was killed because it got saddled with short-sighted commercialization requirements that ignored the benefits of public access to the data -- please don't let the same happen to Landsat.	XXX
Very impressive quality of the picture	XXX
Very pleased with the satellite. Main improvement we would like is increase in pan res. to approx. 5m	COM
Very valuable - keep it going!	EDU
Without an acquisition facility in Antarctica it is not possible to acquire data from L-5. I strongly commend the extension of the Landsat program. I am grateful to the US Govt. and agencies for the initiatives which established and continued the Landsat Program, and the possibility to access the Landsat data.	GOV
Landsat 5 not only provides useful temporal coverage, it is an important back-up system for Landsat 7. One way or another, the availability and continuity of Landsat data must be assured.	COM
In general this is a very valuable program	GOV
Landsat images are very useful for regional mineral exploration programs. Adding more bands would be the most useful enhancement for our purposes.	COM
A one-of-kind program full of lost opportunities. The disgraceful mistreatment of the program has hindered advance of a host of earth science disciplines 10-15 years. A great deal more would be known about the land surface of the planet if earlier Landsat were operated with the data collection strategy driving Landsat-7 and if the data price allowed the growth of the land-imaging research community.	GOV
Absolutely essential to continue - it is the ONLY long term baseline. For example I have just read a study of the desiccation of Lake Chad in Africa that drew on Landsat 1 to Landsat 7 data. Lower prices would open the market to multi-temporal studies: these are now carried out with AVHRR at a great loss in spatial accuracy (e.g. fish forecasting services)	COM
Best available data quality in terms of information content Good ground resolution Best historical coverage Best cost/benefit equivalent Very fast data delivery compared to most commercial data providers Best data source for spatial environmental analyses and monitoring	COM
Drop the price of LS5 to a level comparable to that of LS7, otherwise, I see no reason to purchase LS5 imagery. LS7 is a boon to agencies with limited commercial imagery funding. Even for an agency with a large CI budget, LS7 allows the entity to increase their holdings and world coverage.	GOV
Excellent long term remotely sensed dataset...need to push forward to finer resolutions (spectrally/spatially/temporally)	COM
Extremely pleased. The online Earth Explorer web tool is excellent. The EDC turns around our orders within days - superior service to most commercial vendors. Product delivery: perhaps the end product could be enhanced by including Scene specific metadata in an accompanying file.	GOV

GENERAL COMMENTS	Origin
Good stuff. Need better resolution	EDU
Hopefully ther is LANDSAT , the only satellite that really understand what the market needs: - frequent coverage - accessible price - medium resolution - good quality data - world coverage	COM
I am no longer at the job I have been at for the last 9 years which put me in the position to be purchasing Landsat data on a regular basis. But with my present research position I hope to be still purchasing data, but on a reduced level. I am disappointed and a little confused why some of the "zippering" anomalies that I have encountered couldn't be eliminated at the level 0. With some orders I've had in the last 18 months - I've had the data in hand within 3 weeks of putting in the order. I think that's great, but sometimes the order will lapse for longer than that - you must be constantly looking for ways to streamline the purchasing process - but its MUCH better than it was when we had to deal with split billing to pay off EDC and Space Imaging	GOV
I hope that the US government appreciates the value of the Landsat program to foreign affairs. Having worked with Landsat and Spot data for over 15 years the Landsat program has provided a reliable source of data, with the present access through USGS extremely useful and efficient.	EDU
I love the Landsat 7 data, and the way it is accessible via the web. It has made it so much easier to acquire and use than before. Please keep it this way! Thanks.	COM
I rely on cloud free data. The more choices the better.	EDU
I think the Landsat program is very useful. I do not like the fact that Landsat TM data is controlled by a private company and is excessively expensive. I think that more effort should be made to provide Landsat data at reduced prices to non-profit and school related projects. Companies using the data for financial gain and universities that can afford to pay for the data should bear the bulk of the costs, and smaller organizations that do not have the financial resources but wills still make good use of the data should be given a break. Landsat is government funded so more effort should be made to make the data available to the people who fund the government.	EDU
I use and recommend Landsat data for MANY applications bureau-wide.	GOV
It is a great program that has provided very useful information all over the word, it must continue for a long time, perhaps improving resolution (spatial and radiometric).	EDU
It is a tribute to the hard work of a few dedicated government scientists and administrators to have kept the Landsat program alive for 30 years. IT MUST BE CONTINUED!!	EDU
It is a very important program, not only for US consumers but researchers and educators around the globe.	EDU
It is extremely valuable to have a continuous and easy-to-access source of Landsat-type imagery. And that the data is copyright-free so that it can shared among users. Our main problems with the current Landsat data (both L5 and L7) are related to the geometric instability caused by the scanning mechanism. We would prefer a push-broom-type sensor instead. Also an integrated sensor for atmospheric correction would be very useful.	EDU
Landsat 5 pricing - if not changed since pre-Landsat 7, precludes significant use in our program	GOV

GENERAL COMMENTS	Origin
Landsat 7 is an AMAZING success story. From the quality of the radiometric calibration, to the 100m accuracy of ephemeris-based geocoding (thank you Jim Storey), to the GREAT web-based image browsing/ordering system, to the price of the data, to the 15m pan band, to the fast delivery of the data, to the delivery in GeoTIFF format, the Landsat 7 is THE BEST example of a successful government program that I can think of. Given this success, I VERY STRONGLY URGE that EDC/USGS keep as much of the processing/delivery/geocoding production work IN HOUSE, and NOT leave such things to the private sector. Giving in to the whining of several small value-added shops will increase end-user price, increase delivery time, and remove safeguards for ensuring that all delivered data satisfies stringent standards for processing quality/accuracy.	GOV
Landsat 7 program is a success! We need to continue.	EDU
Landsat is an excellent program that must continue with same or higher quality of data, unlimited sharing of imagery, and lower cost access to imagery.	GOV
LANDSAT TM data are terrific, but society is just now BEGINNING to put the satellite into harness. Build on that success. There is a need for 4 to 16 LANDSAT TM satellites, equi-temporally placed into orbit (equal time intervals between overpasses of any two satellites), and there is a need for many more spectral bands with 30-m resolution, as well as fewer bands with higher spatial resolution. Each spatial resolution and spectral resolution data range has a set of problems best suited for that data set. We need to find them, and that won't happen until we have the data to experiment with, especially in universities, where objective research is common. Industrial research is usually too focused on the answer the boss wants to hear	EDU
Landsat TM is helpful for under developing countries because of its low price	GPV
Landsat, due to its good original design, availability, and continuity, is the backbone of satellite-based remote sensing for university and agricultural organizations. Note--in my current projects, I use 3-4 historical Landsat 4/5 images together with each Landsat-7 image.	EDU
Let Landsat 5 operate as long as it continues to provide good data. Don't be idiots.	GOV
Our primary product is a global 1km per pixel Earth image that animators and simulators use to "fly" around the Earth. We produce 80m L5 and 15m L7 regional and metro-area mosaic imagery to allow animators to fly into an area from a global start point. Our base imagery generally is not time nor season sensitive. It would be great if we could buy "older" L7 scenes for significantly reduced pricing. Older L5 MSS data at reduced cost (such as the U.S. NALC dataset) would also be very helpful.	COM
Overall, very useful data, but price and accessibility are still preventing a lot of use in our media applications.	CP,
Please keep the Landsat program functioning and with adequate support to maintain our ability to rapidly access data about our nation and other nations around the globe. The Landsat program is the key to our ability to measure the rate of human consequence on the earth's biota. The Landsat program is critical to our continuing quest to understand our world.	GOV
Please note that there are many lost images from the early days with EOSAT. It is not wise to allow those files to become lost to scientists, even though they may exist on tape somewhere. ALL Landsat should be maintained by the US Government and made available to researchers. There should always be a cost to the users, but that can't be allowed to rise so high that the images are no longer used. Grad students are put off by the high cost and lack of availability of the data.	EDU

GENERAL COMMENTS	Origin
Question D1 did not make any sense to me. I use DTM's for orthorectification. Would like to see 10m pan data in future Landsat systems.	COM
Regarding Landsat 5, it would be very useful to continue if future scenes could be provided for $600.	GPV
The continuation of the Landsat 7 program is of tremendous importance for all geoscientific studies. The Landsat is so successful since the beginning of the seventies that a continuation could not be stopped, especially for long term studies. Therefore also the Landsat 5 should be kept alive, since it reduces the repetition rate significantly	EDU
The greatest need is to provide better temporal coverage. The ideal situation would be an overpass once every 3-4 days.	GOV
The Landsat program is, in my opinion, crucial to ongoing research which utilizes satellite imagery. Landsat data is probably the best "bang for the buck" currently available. Continued use of Landsat 5 would be desirable in order to have return coverage of areas every 8 days instead of 16 days. However, the current $4,400 cost of Landsat 5 essentially puts it outside of the affordability range for many users that utilize Landsat 7 data.	EDU
The Landsat program has been vital for the application of the remote sensing capabilities. Without the Landsat program remote sensing in e.g. Demark would be restricted to meteorological applications and common man would seldom have "another view" of his own neighborhood.	XXX
The Landsat program has been, and will continue to be, essential to our organization as a primary source of data to support our environmental monitoring efforts, for the foreseeable future.	GOV
The latest specifications on the Landsat web site, present a disturbing picture of a system being designed for NASA global change scientist without consideration for the rest of the user community. I am especially disturbed by the proposal to reduce the Pan bandwidth and centering to a spot look alike when the commercial 1 meter systems and the L& pan have shown the value of the present bandwidth.	COM
This program is important for any kind of studies related with land use, resources management, as well as for other scientific research and teaching in the university.	EDU
Three areas need improvement: 1) Ordering Landsat data from the EDC DAAC via the EDG system is unnecessarily cumbersome and the interface is poorly designed. Ordering a large number of scenes rapidly becomes time consuming and stressful. 2) The ETM calibration information is not presented clearly. In addition the Landsat GeoTiff format does not carry calibration metadata or the band hi-low gain state forcing the user to query these metadata via EDG (see 1) if they wish to calibrate the data. 3) Insufficient information on the anticipated time of data delivery of a Landsat scene is given after submitting an order. In particular, certain ground stations outside of the US seem to take very long periods of time to deliver the data to EDC DAAC. This is very unhelpful when users are attempting to acquire data rapidly in support of fieldwork or to capture temporally intermittent phenomena.	EDU
We are happy with the accessibility of the Data and the speed it has been provided.	COM

End of comments

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